TECHNOLOGY DEPT.

FLIGHT MAGAZINE

JUNE 1954
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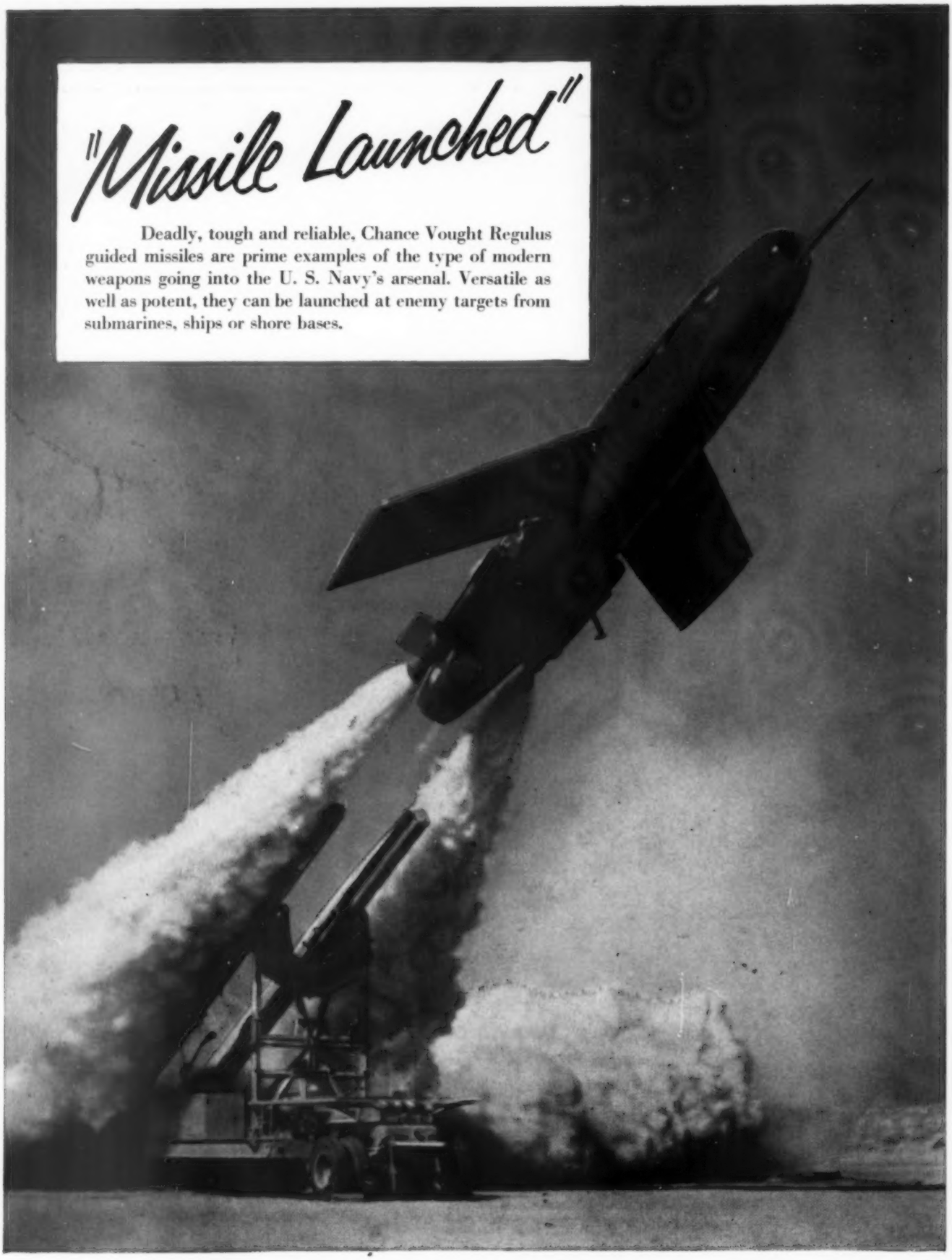
LOCAL AIR SERVICE PROGRESS

(See pages 24-57)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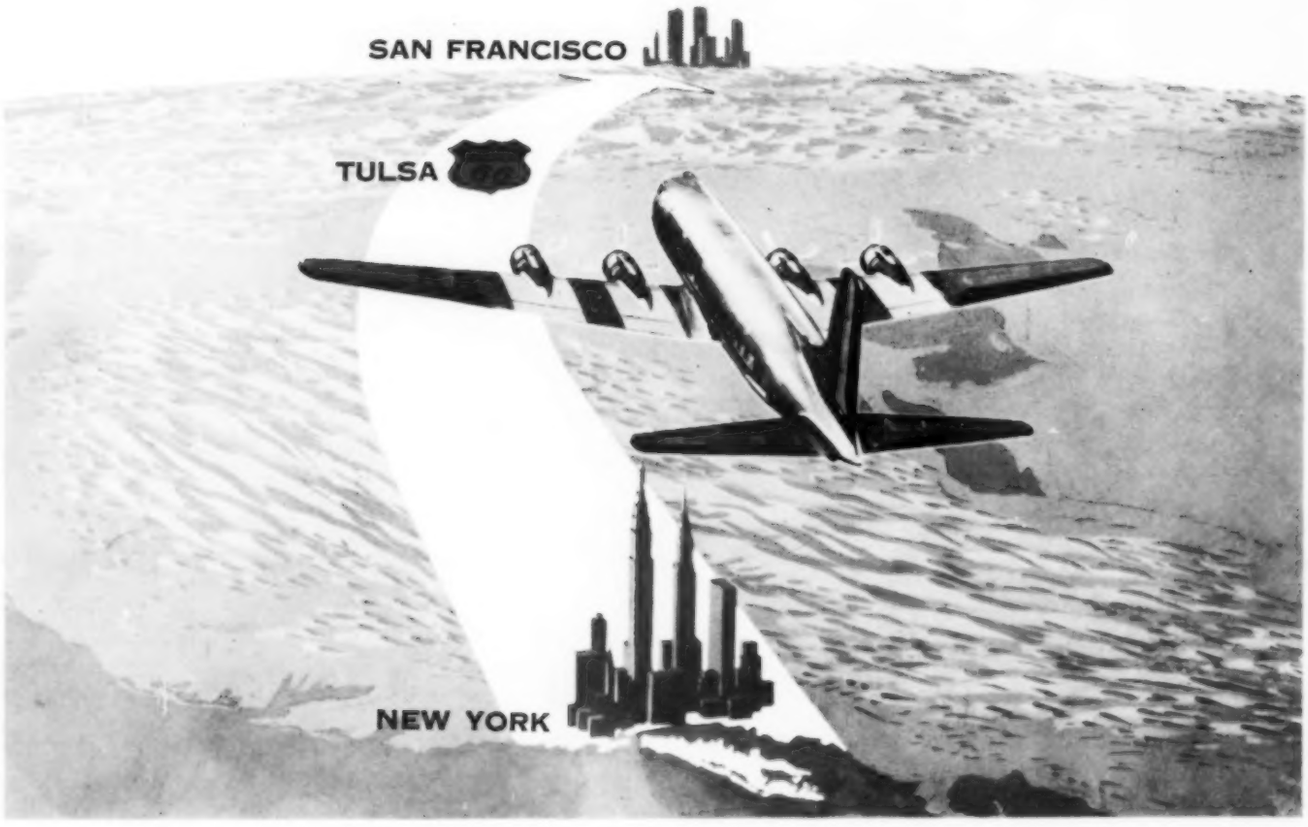

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AVIATION PRODUCTS

AIR Report
Significant Trends and News

THE U. S. AIR FORCE WILL PURCHASE AND INSTALL RADAR APPROACH CONTROL EQUIPMENT AT EIGHTEEN LOCATIONS originally scheduled in the CAA program (RAPCON). The Air Force will pay salaries of CAA personnel operating the stations for one year. Locations of the stations are: Tampa, Takoma, Oklahoma City, Shreveport, Savannah, El Paso, Austin, San Francisco, Great Falls (Montana), Ladd (Alaska), Mobile, Waco, Ogden, Wichita (Kansas), Newberg (New York), Albuquerque, Tucson and Montgomery (Alabama). Some observers see this development as a foot-in-the-door move on the part of the military towards control of the Federal airways system.

NATA HAS APPEALED TO A SENATE APPROPRIATIONS SUBCOMMITTEE for consideration of economies available through civilian aviation mechanic schools, charging that military spokesmen have stated they do not intend in the future to utilize civilian aviation mechanic courses. John T. Griffin, NATA vice president for training, presented the organization's case.

500,000 PLANES HAVE BEEN PRODUCED IN THE UNITED STATES since the Wright Brothers' first flight on Dec. 17, 1903. Half of the total was built in the last 10 years. The half-millionth airplane was built last month. Douglas Aircraft says it has produced 37,264 planes.

DEMAND FOR NEW NARCO DME UNITS HAS CREATED A HEAVY BACKLOG OF ORDERS FOR NATIONAL AERONAUTICAL COMPANY, Ambler, Pa. Sales Manager Gil Quinby says five distributors have placed orders for more than 10 DME's each, with Air Associates ordering 15 of the $4,995 units. First round of deliveries to aircraft owners was made last month.

OVER 40 PIPER APACHE AIRFRAMES WERE IN PRODUCTION OR FLIGHT TEST STAGE LAST MONTH, with two of the new twins entering production every three days in May and with one a day expected early in June. Forty of the $32,500 Apaches represent $1,280,000 in sales at list price.

NEW PRICE OF $69,500 FOR AERO COMMANDER became effective last month on airplane No. 151, first of a new Model 560 version which replaces the Model 520 in production. Old price was $66,000. New price, which is the same as that for Beech Twin-Bonanza, includes more horsepower and many improvements and equipment as standard that was formerly optional. See details on page 60 of this issue.

SOUTHWESTERN NBAA MEM-

(Continued on page 78)

FLIGHT MAGAZINE

Including SOUTHERN FLIGHT and MODERN AIRPORTS

JUNE, 1954 VOL. 41, NO. 6

COVER: This month's cover is devoted to progress by the local airlines, for which a special section appears on pages 24-57. Photo shows familiar DC-3, workhorse of the local carriers. This one is operated by Lake Central Airlines. —(Lake Central Photo.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager, P. O. Box 750 (1901 McKinney Ave.), Dallas, Texas—Telephone STerling 2125.

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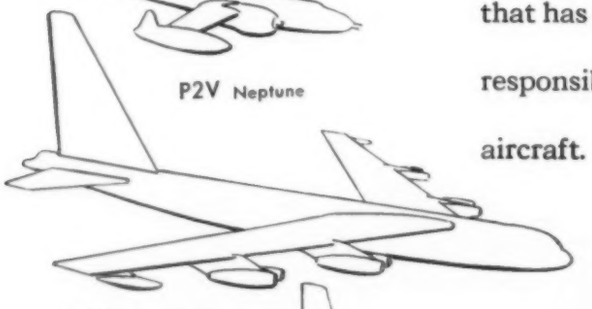
TEMCO Model 33

PLEBE
MILITARY TRAINER

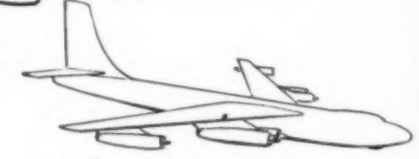
F-84 Thunderstreak

F3H Demon

P2V Neptune



B-52 Stratofortress



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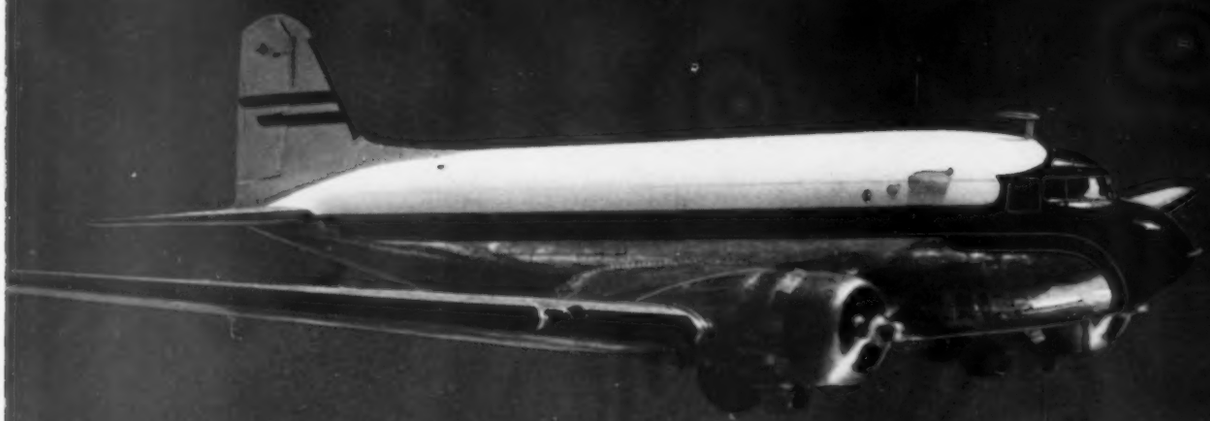

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In recent years rising maintenance costs for aircraft piston engines have been a serious threat to the economy of the Local Service Airline. The Van der Horst Corporation is proud of the contribution that they have made to offset some of this cost. Aircraft engine barrels reclaimed with CAA approved Porus-Krome cost but a fraction of the cost of new cylinders and have AT LEAST twice the life of raw steel barrels. In addition, aircraft engine cylinders incorporating wear, corrosion and abrasion resistant Porus-Krome account for a substantial reduction in engine lube oil consumption.

Copies of Mr. Heck's cartoon, free of advertising copy and suitable for framing, are available on request.

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Just among ourselves

THE ACC ON LOCAL AIR SERVICE

THE Air Coordinating Committee's Air Policy Report to the President of the United States has just been released to the public. What it has to say on the subject of local service air transportation is particularly timely as we go to press on our Fifth Annual Local Service Airline Edition. Here is a direct quotation from the ACC report:

"Many of the local service airlines have shown only limited progress toward self-sufficiency. For the local service group as a whole, subsidy in recent years has represented roughly half of total operating revenues.

"The basic economic problem of local service operations is caused by the character of their routes. These generally have low traffic density, combined with short-haul operations, high operating costs and strong competition from surface transportation.

"Routes should be amended to eliminate points which have demonstrated inadequate traffic to justify scheduled air service. There may also be opportunities to improve route systems by mergers between local airlines or between local and trunk airlines.

"After suitable adjustments, the local service airlines should be required to meet a definite schedule of orderly reduction leading to eventual elimination of subsidy. If a local airline does not make significant progress toward self-sufficiency, within reasonable time and under normal economic conditions, its certificate should be terminated.

"When a certificate is terminated, those portions of routes required to meet public needs should be transferred, to the extent practical, to an airline capable of providing the service with reduced or no subsidy. The responsibility of airlines with strong routes to provide needed service on weak routes should be stressed."

While most of the preceding quotes are so much watermelon talk and generalization without any specifics in time or in standards or in suggested new formula, it is clear that official ACC policy calls for an early end to the so-called local service air transport "experiment." You don't have to be clairvoyant to see the handwriting on the wall. Mergers to strengthen the hand of monopoly. Economy — not the national interest in basic transportation — is the guide. The little man must go. Only the large will be permitted to survive. That's what the ACC report says in effect.

We don't believe that President Eisenhower will buy this batch of gobbledegook inspired by the surface carriers and the Republican hatchet men. If the rest of the ACC report is as inane as the chapter on local air service, maybe the President will dissolve the Air Coordinating Committee and send its members back to the Budget Bureau, the Commerce Department, the Navy, the Army, the Air Force, the ODM, the Post Office, the State Department and the Treasury Department from whence they came as "aviation experts." Nor do we believe that Chan Gurney, chairman of the Civil Aeronautics Board and member of the ACC, can go along with the recommendations of the majority on local air service. If he does, he should be cashiered, too, along with the rest.

Meanwhile, to the Air Coordinating Committee and to the President's White House staff now busily engaged in a study of the Civil Air Policy report, we commend this particular issue of FLIGHT MAGAZINE, dedicated in a large part to a factual summary of local air service progress. It might at least serve to educate the uneducated and inform the ignoramuses into whose laps the destiny of civil aviation unfortunately has been dropped.

MILITARIZATION AGAIN

It will not be denied that power is of an encroaching nature and that it ought to be effectually restrained from passing the limits assigned to it.

—JAMES MADISON in 1788

WITHIN a few short weeks more than twelve per cent of our Federal airways system's approach control centers will be owned and controlled by the U. S. Air Force.

The clever little game is this — with Civil Aeronautics Administration funds being chopped into annihilation by the Republican administration, it is a simple matter for the military with its almost unlimited billions to procure and set up the latest types of avionic and radar equipment and start taking over the Federal airways system.

There are several interesting aspects of this development which is going on so silently the people who will be most affected by the scheme aren't even aware of it. First, the military usurpers justify the radar operations on the flimsy basis of the "jet penetration problem" in various high-density areas near military air fields such as McDill at Tampa, Fla.; Tinker at Oklahoma City; Barksdale at Shreveport and Kirtland at Albuquerque. Second, when the military takes over the approach control centers veteran trained CAA personnel still have to go along to operate them *for one year*. Then what?

The British found out that operating the Comet together with other commercial airplanes and military jet operations didn't pose any particularly difficult traffic control problems. The only difference between jet and piston-engine aircraft operations is that the jet pilot must commit himself higher and farther out, and have definite runway space and time allotted. In most cases such operations have to climb up and descend through airline, business and private flying airplane traffic. Why the CAA can't continue to do this basic job in air traffic control, no matter whose traffic is involved, has never been satisfactorily explained. They still have to use CAA personnel.

Perhaps we are rather naive in holding on to the old belief that the na-

(Continued on page 91)

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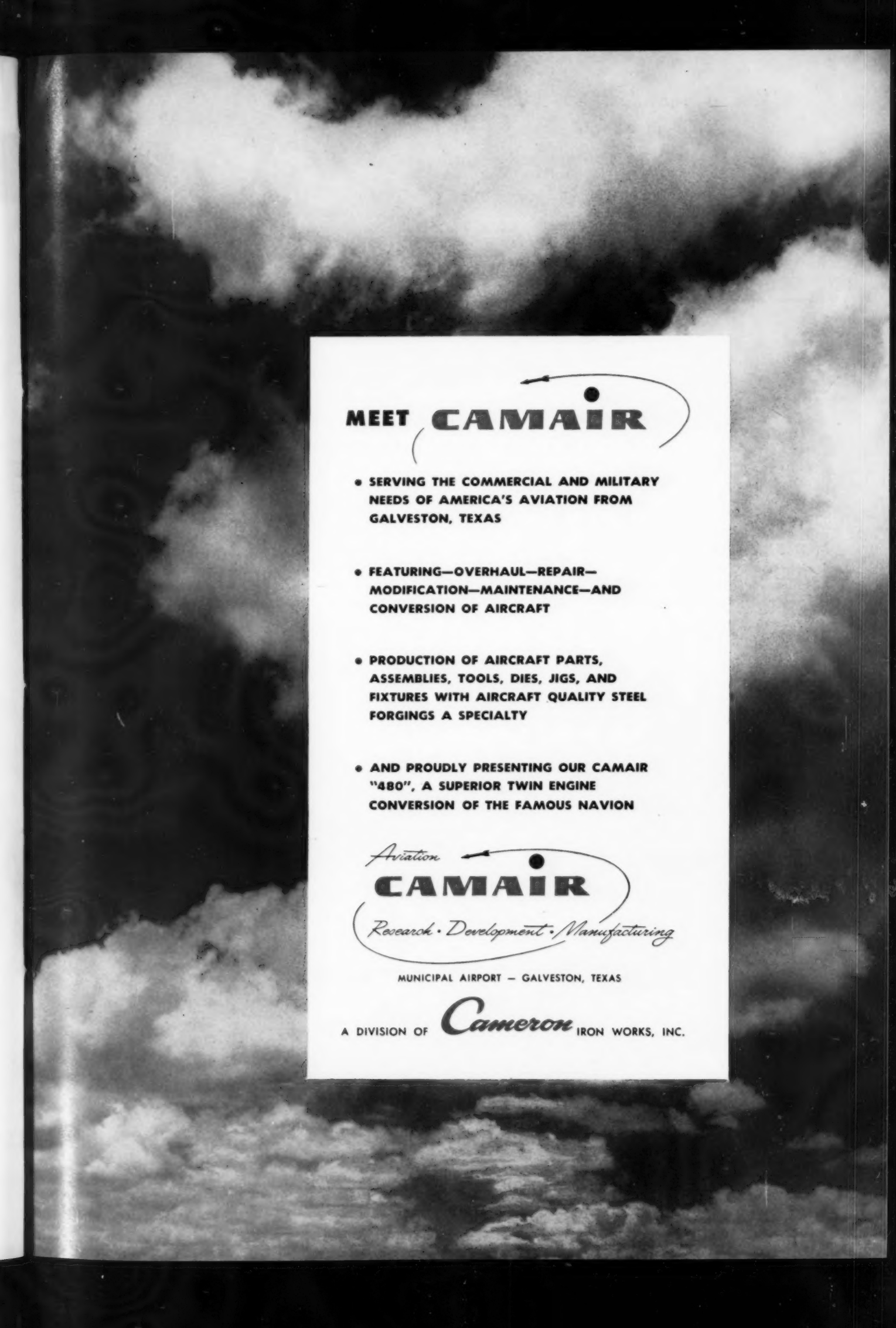

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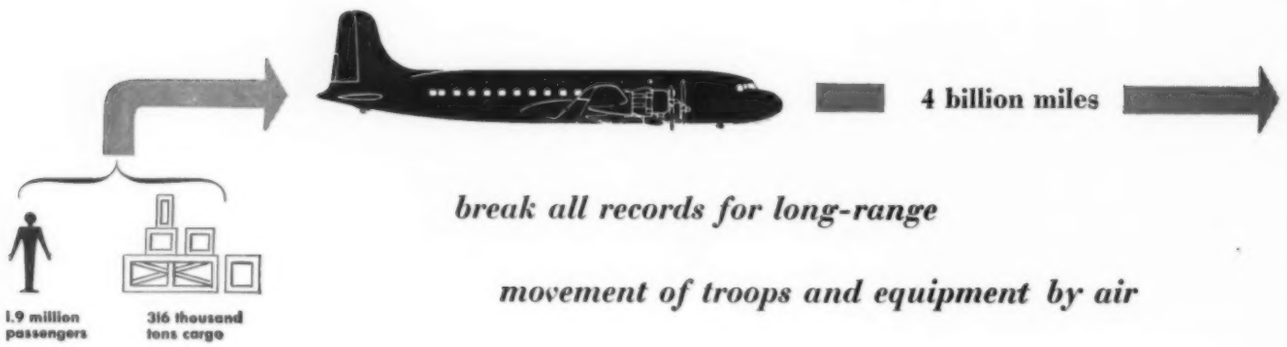

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- **It combines the delicate accuracy of a proved gyro navigation system with the long-term reference reliability of a new Flux Gate* transmitter weighing less than one pound.**
- **It is designed for all operational types of aircraft from carrier-based fighters to multi-engine aircraft, including bombers and commercial transports.**
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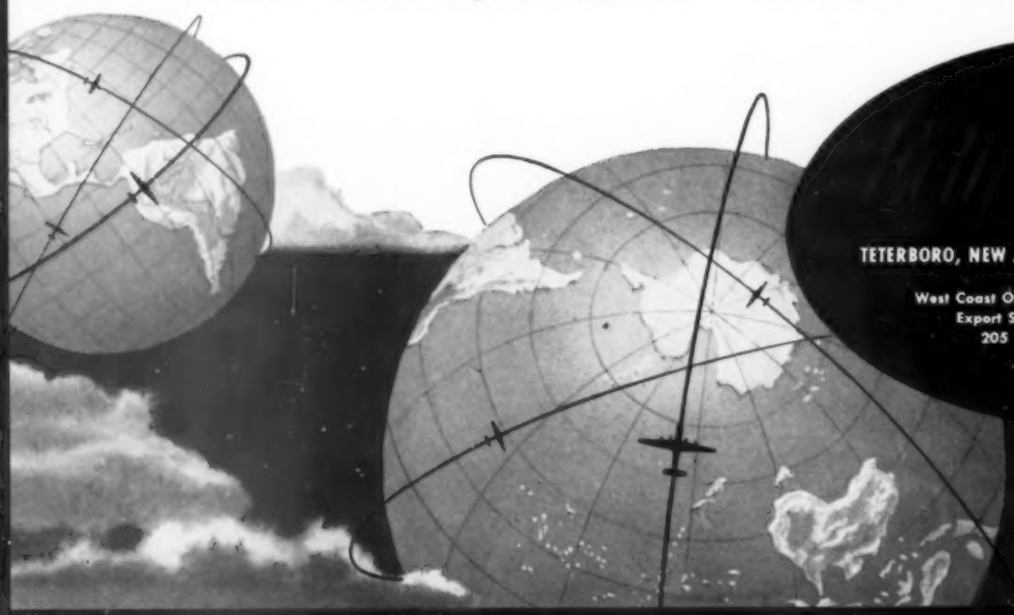

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DC-7

The first DC-7 delivered to Delta-C&S was christened the "Royal Biscayne," now the fastest deluxe "name" flight between Chicago and Miami. The second "Seven," the "Royal Poinciana," established a new coast-to-coast airliner record of 5 hrs. 29 min. between Santa Monica and Jacksonville.

With its superior cruising speed of 365 mph the DC-7 will, as shown below, offer the fastest service over every route on which it is scheduled.

Powered with the Wright Turbo-Compound engine, the Delta-C&S "Sevens," of course, embody such standard features as higher effective cabin pressurization and full-time Freon system air conditioning, but . . .

"These Sevens" are Different

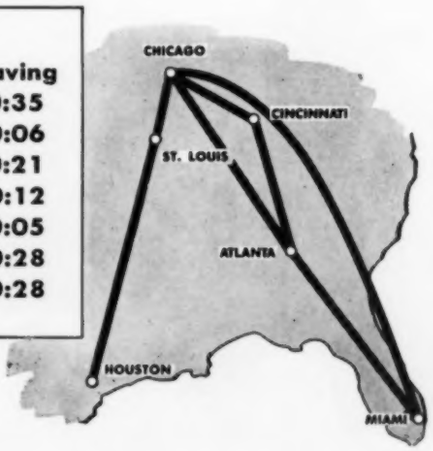
The "Royal" prefix on the Delta-C&S DC-7's actually indicates a different configuration of the basic Douglas design and merits a crown of distinction. First is the basic cabin plan which is divided into four sections: the forward Sky Room, the Main Cabin, the After Cabin, and the Sky Lounge. By eliminating long rows of seats stretching the full cabin length, Delta-C&S partitioned cabins achieve a more pleasant intimacy and give the strolling passenger a succession of views.

Then, the location of lavatories between bulkheads opposite the propellers results in a 20% reduction of sound level in the cabin.

Topping the improved features is a new, specially designed seat by Hardman which provides a full 20" width and 45° recline. Headrest is curved to provide side support for napping passengers without neck strain or sprawling over neighbors. Transverse seat beams eliminate all under-seat structure and give 5 inches more clearance for long legs.

Thus the Delta-C&S DC-7's are really a very special line of "Sevens"—a line that we identify with the crown of leadership. We hope you'll have a chance to try one soon.

	Old Time	New Time	Saving
Chicago—Miami	4:15	3:40	**0:35**
Chicago—Cincinnati	1:10	1:04	**0:06**
Chicago—Atlanta	2:20	1:59	**0:21**
Atlanta—Miami	2:15	2:03	**0:12**
Chicago—St. Louis	1:09	1:04	**0:05**
St. Louis—Houston	2:46	2:18	**0:28**
Chicago—Houston	4:16	3:48	**0:28**



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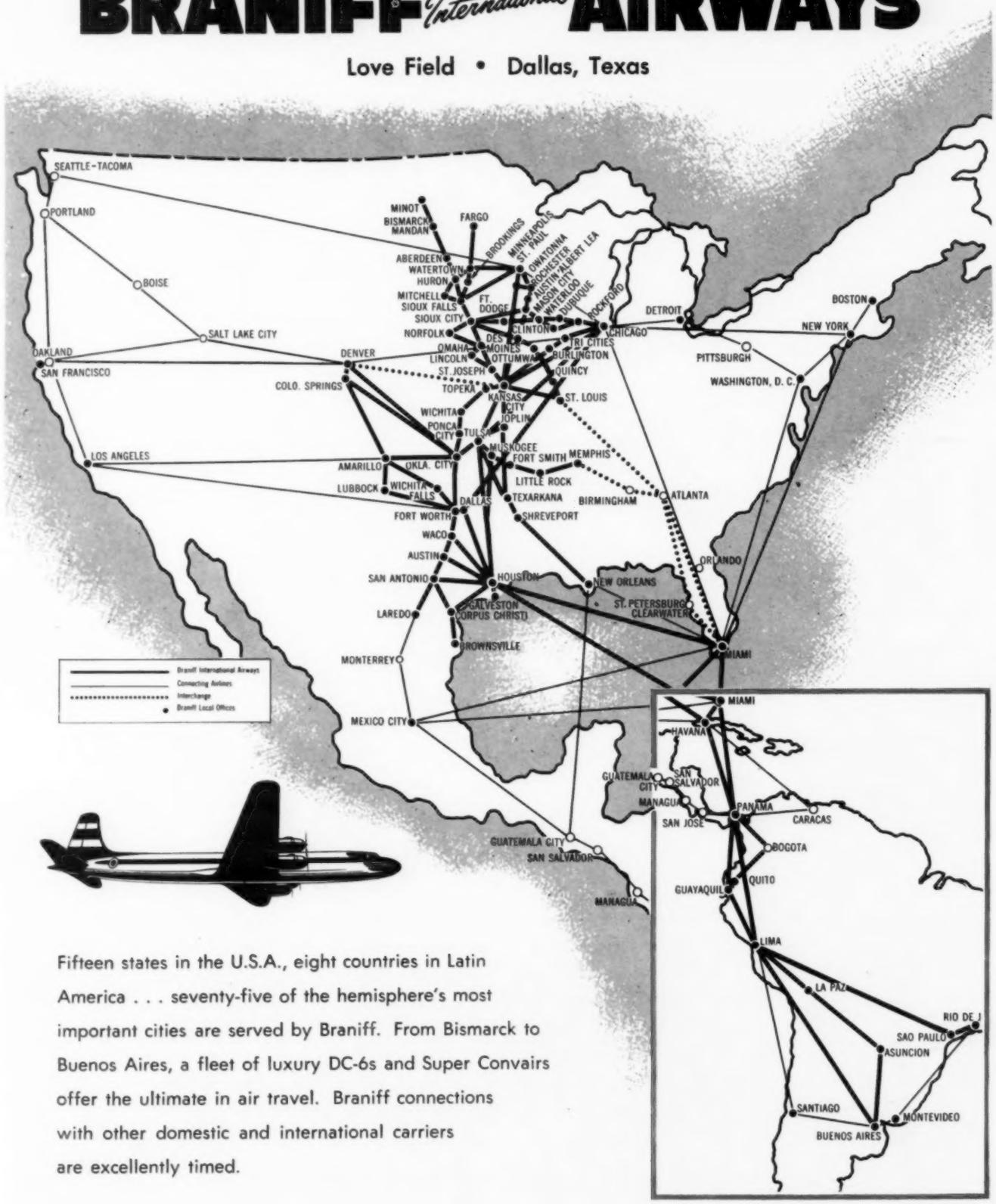

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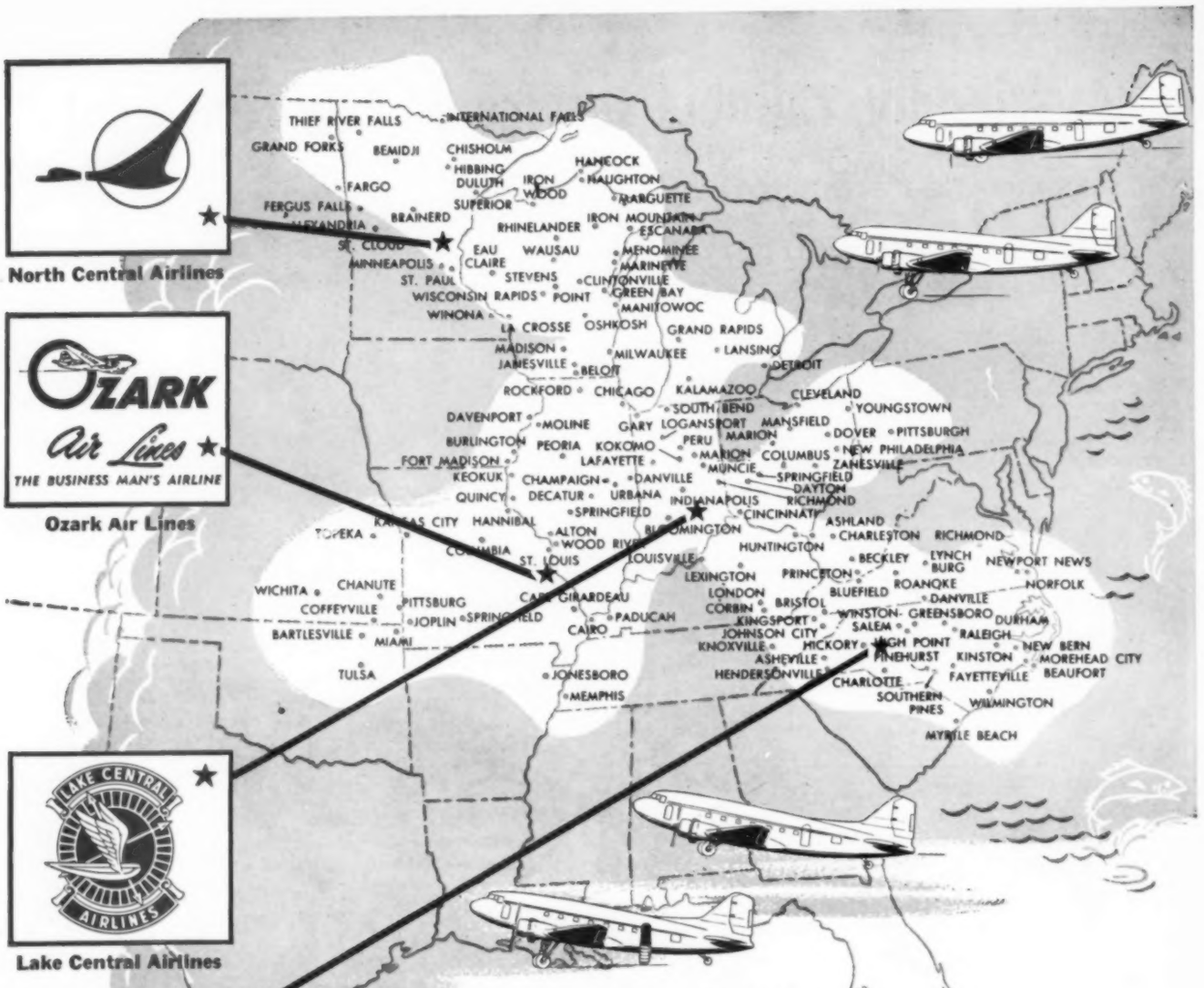

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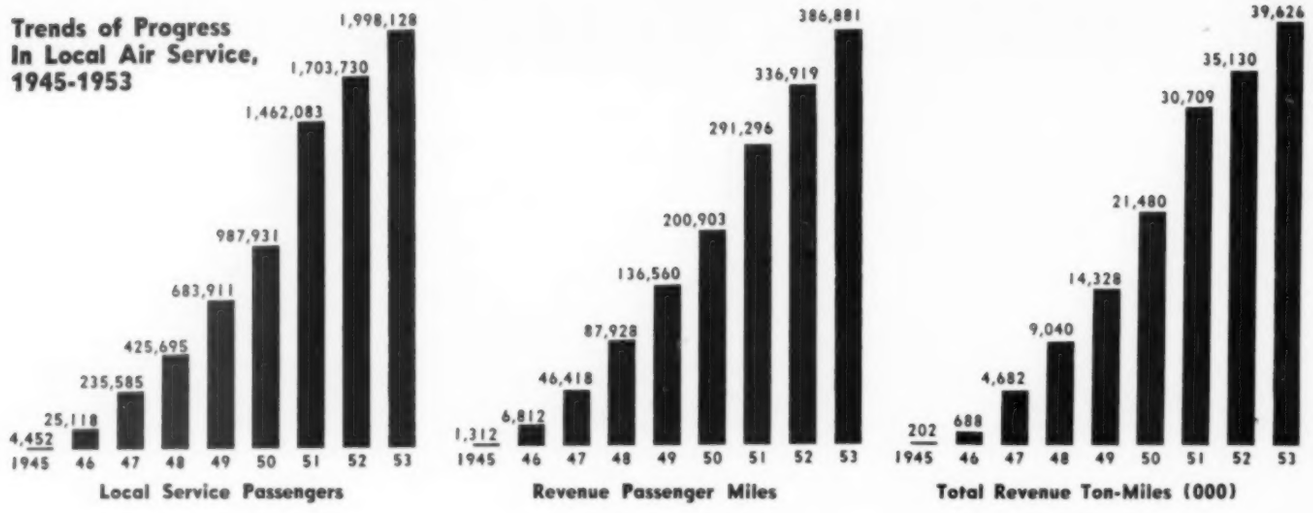


Permanent Certification for Local Service

Air service to small cities merits the same opportunity to survive accorded trunks in 1938

By GEORGE E. HADDAWAY

ATTAINMENT of self-sufficiency by the majority of our nation's "grandfather" trunk airlines in recent years and the general prosperity of our war-born economy have dimmed certain pages of domestic aviation history.

Even the people who breathe aviation day and night have forgotten just who in the way of leadership and what principles and what policies were responsible for creating the world's largest, most efficient and most profitable air transport system.

Only those who have not forgotten all the blood and sweat and vision that went into the establishment of this transportation system can appreciate the fact that history is repeating itself in the matter of establishing useful and efficient scheduled air transportation to the smaller towns of the nation. Only those who remember will recognize that many of the same pains and tribulations experienced by the trunk-lines in the pre-war era are now being experienced by the local carriers today.

Permanent Certificates Needed

Recent testimony before the Senate Interstate and Foreign Commerce Committee in behalf of permanent certification for the local carriers bears out this statement. Donald Nyrop, former chairman of the Civil Aeronautics Board and now general counsel for the Conference of Local Airlines, quoted figures to the committee that show our local airline services are just about where our domestic trunk services were back in 1938.

In 1953, for example, the local airlines carried 60 per cent more passengers than all the trunk-lines carried in 1938. The locals carried five times as many passengers in 1953 as the domestic trunks carried after the Big Four passengers are excluded. In 1953 the locals flew almost as many revenue miles as the Big Four in 1938 and more than double the revenue miles of the rest of the domestic carriers in that same year.

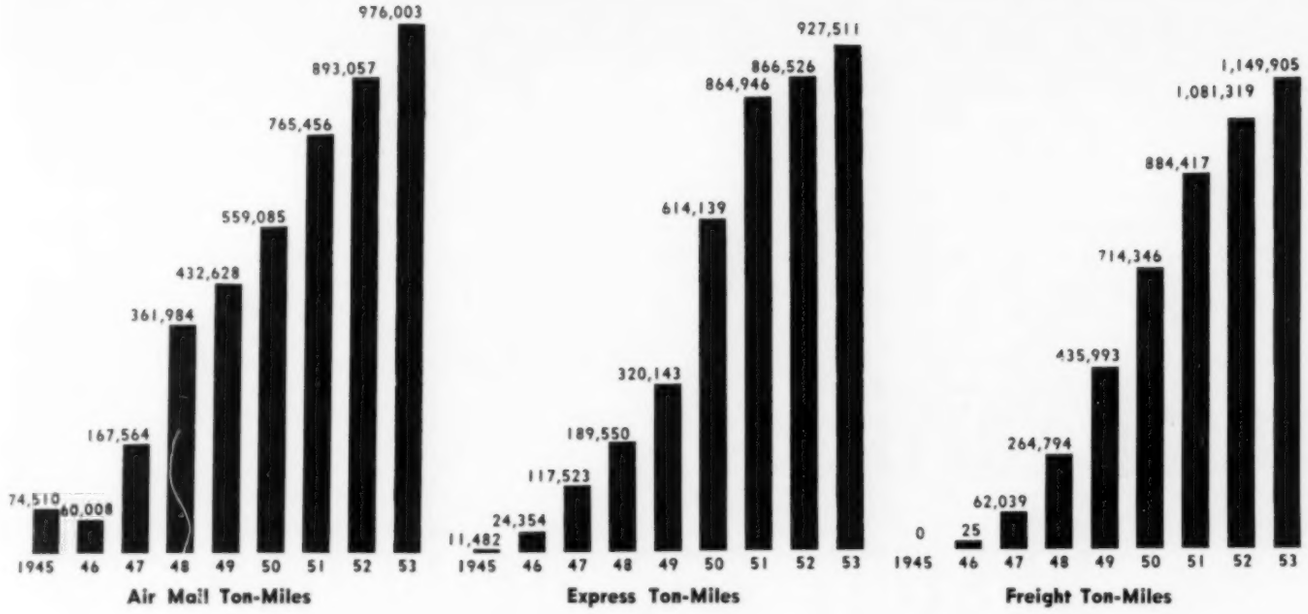
Back in 1938, nearly 39 per cent of the total revenue of all domestic carriers was mail revenue. The Big Four — American, United, TWA and Eastern — operating the long haul, heavily traveled and most profitable big city routes, received 32.4 per cent of their revenue from mail. Excluding the Big Four, the rest of the trunk-lines depended on air mail for 50 per cent of the revenue.

The percentage of mail pay subsidy figures for "grandfather" lines in 1938 is almost exactly the same as for the locals in 1953. Yet the local carriers as an industry group with a definite pattern are just about six years old! So if one's objective approach to the local service airline situation today enjoys the intelligent perspective of historical knowledge it must be admitted that the local service carriers *as an industry* have done mighty well. Operating under severe handicaps of temporary or "experimental" certificates, which in turn has hindered investment capital, straight-jacketed by rules and regulations and government procedures geared to trunk-line operations, chained to routes and schedules with little or no opportunity to truly "experiment," faced with the inexorable rising costs of doing business without benefit of tariff increases, frozen by economic necessity to an antediluvian airplane design and constantly hamstrung by the threat of annihilation while running to and fro between home base and Washington trying to justify extension or renewal of temporary certificates of convenience and necessity, the remarkable growth of local air service in the United States as revealed in the facts and statistical summaries published in this magazine is little short of fantastic.

Political Aspects

The local service airlines today are serving a total of 437 cities of which 258 in 42 states are served by local carriers exclusively. More than 43 million people reside in the areas served by the fourteen companies. So one-fourth of our total population is directly concerned with the ultimate success or failure of the so-called local air service experiment.

Forgetting the matter of public convenience and necessity for that many people, forgetting the needs of postal service to one-fourth of our population and putting aside momen-



tarily the national defense aspects of a strengthened civil air transport airlift reserve as represented by the facilities of the local service carriers, anything that affects one-quarter of the nation's population has deep political significance. As the show-down approaches as to whether local air service will be permitted the same chance to grow and prosper as the trunk-line services, it will be interesting to see the effect of political factors on those in high government positions who have indicated little or no concern with the needs of inhabitants of our smaller towns but rather would dictate, under the shallow excuse of economy, that only the larger towns should have air service and only the old, established large companies should survive. We shall see what we shall see as the cards are now down and everyone knows quite well what everyone else is holding.

While some good has been done "on the hill" in Washington for permanent certification of local carriers, it is quite clear that neither the Hinshaw bill or the McCarran bill will be passed during this session of Congress. However, if the President and the administration make the Air Coordinating Committee Report on Civil Air Policy their "Bible," Congress might step in and take away from the administration the power to knock the local carriers in the head as suggested in the report.

CAB Friction

One of the great blocks to enlightened Federal policy and probably as dangerous to local air service progress is the ACC report is the fact that the Civil Aeronautics Board is probably more divided now than it has been for many years on the whole problem of local service concept and principles. First there is the big split along party lines on the matter of reducing subsidies. The three Republican members are in agreement that subsidy must be reduced substantially but they are not of one mind as to how far and how fast it should be reduced. Again, if the ACC report becomes gospel, it may serve as the common denominator to bring about agreement among the Republican CAB members.

The two Democratic members of the Board appear to be in general agreement that no substantial change toward retrenchment should be made in over-all local service policy. But here again the Democratic members have their own individual ideas that fail to agree on many specifics.

Route Structures

Nearly everybody agrees something needs to be done about revising local service route structures and beefing up service generally. Some CAB members feel it should be the carriers' responsibility to revise routes and press for changes. At least one member of the Board seems to realize the trouble the carriers can get into if they take the initiative of pulling out of those towns that just don't originate enough traffic. One local carrier petitioned the Board to eliminate certain poor route segments and the wrath of the gods descended upon it, from congressional delegations and state officials to municipal and civic officials throughout the area. Since the Board has all of the records as to what the various towns and route segments produce or might do, it doesn't make sense that the carrier should be thrown to the dogs in having to institute proceedings to cease service to any town. But CAB members do not agree on these matters.

Nor do they agree on how far down the line a town must be before service is suspended. Some of the thinking is for removal of all marginal towns and the creation of a secondary air transport system serving only the strong points on present local service routes — a sort of regional trunk-line service. Other members interpret this proposal or approach as a definite end to the local experiment because it is contrary to expansion and that, without justification for a new concept of air transportation, the surviving routes would be absorbed by the trunks. This, of course, fits in with the philosophy of the ACC Civil Air Policy Report now on President Eisenhower's desk.

In an interview with W. A. Patterson, president of United Air Lines, this writer learned that United is unique among the larger trunk-lines because it serves 21 cities with less than 50,000 population. United loses heavily on small town business but more than makes up for it with profitable long-haul runs. If the local service experiment is abandoned, then the trunks must assume responsibility of service to most of the towns. Since the subsidy element will always be in local service operations, Patterson says it is up to the government to decide whether or not it wants to provide that air service and, if so, then what type of service and how much should be spent to provide it.

What can be gained by giving much of the short-haul business to the

(Continued on page 55)

Local Service— Destiny and Definition

An industry leader voices the critical need for long-range local service policies

By LESLIE O. BARNES
President, Allegheny Airlines, Inc.

IT would seem that, after nearly a decade of experience, there would be a firm national policy on the question of (1) whether air service to intermediate cities should be continued, (2) to what extent it should be continued, (3) who should provide this service and (4) the extent to which the service should be underwritten by the Federal government. Of equal importance, it would seem that by now we should be in a position to clearly define just what we mean by local service.

The fact is that there is neither a long-range national policy on this question of local service, nor has local service ever been defined. Executive Order No. 10 — ordering separation of subsidy from mail payments — highlighted the subsidy question, and with it what might be the broader question of whether the subsidized air services are worth what they cost the Federal government. As it now stands, each year these services are publicly re-examined and must be justified on the basis of their value to the nation.

A long-range plan should be developed. It must be based on a careful analysis of the national worth of these services and the alternatives available if the services are not provided. Unless this is done, there is the very real possibility that a precipitate, harmful action will be taken through a determination to prematurely reduce or eliminate subsidy support without regard for the consequences.

Reduced to the barest essentials, there are two basic issues. In the case of the second, there are only two alternatives:

ISSUE I — Is air transportation to intermediate cities necessary in the national interest and to what extent, if any, should this service — regardless of who may supply it — be underwritten by the Federal government?

ISSUE II — If it is in the national interest that intermediate cities be linked into the national air transport system, then the question remains: How can this service be provided at minimum cost to the Federal government? Only one of two answers can apply to this question:

ONE ANSWER — Continue the local service airlines which were created to provide the service, making them as strong as possible short of serious diversion from the trunk carriers, and enunciate this decision as a national long-range objective and policy.

THE OTHER ANSWER — Terminate the local service carriers and require in their stead *the same minimum frequency of operations over the same routes from the trunk carriers replacing them.*

Is Air Service Necessary to Intermediate Cities?

Much factual support has been developed over the past seven years which, without question, clearly establishes this need. While service to some cities might conceivably be discontinued without serious harm, by and large the record at over 200 intermediate-sized communities speaks clearly in defense of the need.

By way of summary, over the past eight to ten years the economic structure of our nation has changed — and the business tempo increased — more sharply, perhaps, than at any time in the nation's history. New businesses have been created in the outlying areas and linked to the larger metropolitan areas, industries have been decentralized, new branch offices created in more favorable labor areas, and excess labor markets in the intermediate cities absorbed — all as a vast and irresistible part of this new area. While this may be associated with a peacetime economy, it is not going to change in the event of a national emergency. Indeed, the need for industrial decentralization and a diversification of effort becomes even more urgent.

Over these past years, much greater productivity is required of the human machine — whether he be salesman, executive, engineer or technician. As a nation, for a variety of reasons, we have decentralized our laboratories, our businesses, our production effort. Air transport has been relied upon as a connecting medium. Often it has been the basis for selecting a specific location.

Nor is local service entirely for the benefit of the businesses and citizens

in the intermediate city. In a recent survey we found that more than 50% of our passengers originate in the large metropolitan areas. The reason for this is clear — businesses in the large cities are just as dependent upon air service to intermediate cities as are businesses in the intermediate cities to the large cities. It's a two-way street.

If this is so, then who is going to take local air service away from even a handful of the cities which have come to rely upon it and have grown with it? By any measurement, air transportation, whether it be between large metropolitan areas, or whether it be between these areas and the intermediate cities, has become a necessary and essential fixture in our national way of life. Since this is so, then there remains only the question of how best to provide air service to the intermediate cities.

The How (or Who) of the Matter

It has been suggested from time to time, and again only recently, that as a means of eliminating subsidy, the trunks should be required to serve the less-profitable — often-costly intermediate cities. This proposal suggests that the profits earned by the trunks could well be used to underwrite the unprofitable air services and routes. This is unsound for a number of reasons. Let's look at three rather obvious ones:

(1) The trunk profit margin is already too narrow. The only "enthusiasm-dampener" needed here is an inspection of the industry's first-quarter reports for 1954 as compared to 1953. Unless there is a general fare increase this year, the profit margin will become even narrower and in some cases critical.

(2) Mix very-much local service operations into a trunk carrier's machinery and several presently subsidy-free carriers will quickly become subsidized. One or two practical — and fairly recent — examples of this are already on record. The $21,000,000 or so (out of $73,000,000 for all services) which the fourteen local carriers will receive for fiscal year 1955 will seem small by comparison.

(3) The trunks have equipped themselves out of the local service market. The twin-engine equipment used by the trunks today will do a fine job at perhaps half of the intermediate airports. Either the trunks will have to re-equip their fleets with DC-3's or someone will have the highly unpleasant — and perhaps embarrassing — job of explaining to the airport authorities, the chambers of commerce and citizens of some 258 communities why they have either no air service at all or very substantially reduced service!

There are other reasons, but these three should be enough to ponder for awhile. Condensed, they add up to this one cold fact: The local service airlines, as a segment of air transportation, cannot be replaced by the trunk lines at any national saving unless there is a wholesale abandonment of air service to two hundred-odd intermediate communities now receiving scheduled air service.

About the Author

Leslie O. Barnes, youngest president of a scheduled certificated airline in the United States, moved into the presidency of Allegheny Airlines after joining the airline two months earlier as operations director. He has been identified with aviation since 1937. Prior to joining Allegheny, he was executive director of the National Air Transport Coordinating Committee in New York City and was director of operations for the Air Transport Association of America from September, 1946, to February, 1952. Before that he was associated with the Civil Aeronautics Administration and American Airlines. Allegheny Airlines serves 50 cities in seven Middle Atlantic states and is the only local carrier serving Washington, D.C.

Forbidden Territory

A major factor contributing to the absence of either a long-range policy or a definition of the local service sphere of activity is the uncertainty of precisely how the local carriers fit into the scheme of things and the course their future development will take.

The uncertainty is by no means confined to any one person or group of persons — whether he or they be a segment of the industry, a government agency or bureau, or a committee. The local carriers, themselves, tend to differ to some extent on the matter of their ultimate development. The management policies of the trunk carriers vary from complete acceptance and support of the two-level philosophy to consistent resistance to any development or strengthening of the local carriers.

Philosophies on how large the local service carriers should be, and what restrictions should be placed on their operations to avoid excessive competition to the trunks, also vary — both within the government and among and within the carriers. Up to the present the overwhelming and persistent demands for local air transportation, the increasing acceptance of the services offered, the inevitable exemptions, shifts and adjustments to meet newly-developed demands, have permitted little time for a careful and searching examination of these questions.

The trunk lines — even those supporting the local service concept — either keep a most watchful eye on their younger brethren, or are downright distrustful of them and their motives, and well they might, too, because unless some pretty careful lines are drawn and a plan of development defined, it is conceivable the local carriers might very well become a serious competitive threat to the trunks. The threat does not lie in our activities at the intermediate cities; this activity is in strict accordance with the initial reason for our creation. Rather, the threat to the trunks is found in the possibility of our ultimately penetrating the non-stop operation between major trading areas.

This is forbidden territory and local carriers have no business invading it. The trunk lines should be insured, so to speak, against this threat for two reasons: First, this is not our role, nor was it ever intended that it would be. Secondly, the ultimate success of the local service concept is dependent upon our concentrating on our particular mission—service to intermediate cities.

It should not be difficult to give this needed assurance to the trunks, because no other course of action makes any real or lasting sense. It must seem obvious that if the survival and growth of the local carriers are dependent upon long-haul business between major trading areas, then the original basis for our creation no longer exists. It was never intended that we should do other than provide the best possible service to intermediate cities and should we or the Civil Aeronautics Board forget this, then all we would succeed in doing would be to repeat the mistakes of the past.

The fulfillment of our role — indeed our survival — is dependent upon our imagination, and the concentration of our abilities and energies on the development of air services at our intermediate cities. We should carry

(Continued on page 44)

Local Service Airlines Growth, 1949-1950-1951-1952-1953

(Comparative Operating Statistics for Each Year)

	1949	1950	1951	1952	1953
Revenue Plane Miles	23,994,931	33,593,736	37,797,136	40,697,348	44,841,634
Number of Revenue Passengers	683,811	987,931	1,462,083	1,703,730	1,998,128
Revenue Passenger Miles (000)	136,560	200,903	291,296	336,919	386,881
Available Seat Miles (000)	479,663	607,508	762,542	871,947	979,654
Revenue Passenger Load Factor	28.47	33.07	38.20	38.64	39.49
Mail Ton-Miles	432,628	559,085	765,456	893,057	976,003
Express Ton-Miles	320,143	614,139	864,946	886,526	927,571
Freight Ton-Miles	435,993	714,346	884,417	1,081,319	1,149,905
Total Revenue Ton-Miles (000)	14,328	21,480	30,709	35,131	39,626
Available Ton-Miles (000)	53,648	69,380	87,003	98,419	141,424
Revenue Ton-Mile Load Factor	26.71	30.96	35.30	35.69	35.69

—Table by Ray & Ray, Consultants.

Impact of Local Route Restrictions

A study of local service trends emphasizes the penalties in current certificates

By GOTCH and CRAWFORD
Planning Consultants

THE current financial condition and the operating trends of the local service industry argue for modification of the route restrictions which are written into local carrier certificates. These route restrictions, in their present form, have the dual effect of adding to expenses and limiting revenues. They add to expenses by requiring multi-stop service along a route with the result that submarginal stations receive more service than may be economically justified. They limit and confine revenues by effectively excluding local carriers from lucrative markets on their routes which are local in character.

These consequences have an important effect upon the net results of the local carrier industry and upon the ability of the local carriers to show continuing improvement in the future. Relaxation of the restrictions will materially improve the industry's average length of hop, traffic volume, traffic density, unit costs, and net financial results, with a corresponding reduction in their "need" mail payments.

These conclusions and the supporting discussion are drawn from an extensive economic analysis and report prepared by our firm for the Conference of Local Airlines.

Contrast Between Trunk and Local Carriers

For the year ending June 30, 1953, the local carriers served 39% as many route miles and flew approximately 10% as many revenue miles as trunk carriers. While one passenger in every fourteen was a local service passenger, for every $100 spent domestically on air-passenger travel, only $2.88 went to local service carriers.

During the same period the average trunkline flight had more than two-thirds of its seats occupied while the average local service flight had only 38% of its seats in use. The average trunk passenger flew 541 miles or almost 2.8 times as far as the average local service passenger. When the average trunk passenger bought a ticket, he paid $29.65. The average passenger of local carriers paid about one-third as much, or $11.28.

During the second quarter of 1953 the average local service station enplaned 15 passengers per day while the average trunk station enplaned 125 passengers. In other words the local carriers had 50% as many landings and take-offs as the trunk carriers but only generated 8% as many passengers. The average trunk station developed daily passenger revenues of $3,718, with 21% or $769 spent as station costs, while the average local carrier station yielded $168 in passenger revenues, with $70 as station costs per day.

It is emphasized that the figures do not express relative efficiency but rather relative opportunity—the contrast of net economic characteristics.

These differences in economic characteristics resulted in no subsidy mail payments to ten of the trunk carriers and subsidy payments of $2,797,000 to three trunk airlines as contrasted with $21 millions for the 14 local airlines. The thirteen trunk carriers netted almost $59 millions in profit for the year 1953 while local carriers lost almost $2 millions.

This discussion of economic differences points up the low-density, short-haul nature of local service operations. If local carriers had experienced a passenger load factor of 67%, as the trunk industry did, passenger revenues would have been increased by over $16 millions, or an amount

Local Service Airlines Revenue Growth, 1946-1953

Year	Passengers	Per Cent of Total	Mail	Per Cent of Total	Express and Freight	Per Cent of Total	Other	Per Cent of Total
1946	$ 314,638	16.29	$ 1,558,614	80.71	$ 13,008	0.67	$ 44,797	2.22
1947	2,280,124	26.99	5,057,097	70.51	60,179	0.71	150,931	1.79
1948	4,666,549	28.64	11,282,490	69.25	147,159	0.91	195,511	1.20
1949	7,362,007	33.55	14,054,998	64.88	252,159	1.11	271,466	1.23
1950	10,302,859	36.94	16,384,321	58.74	442,046	1.58	763,718	2.74
1951	15,757,569	43.86	18,575,430	51.71	629,886	1.75	962,801	2.68
1952	19,171,798	45.95	21,151,074	50.70	593,661	1.42	805,878	1.93
1953	22,651,768	46.70	24,182,057	49.86	903,003	1.86	763,760	1.57

—Table by Ray & Ray, Consultants.

Local Service Airlines Traffic, 1945-1953

Year	Revenue Passengers	Revenue Passenger Miles (000)	Passenger Load Factor	Air Mail Ton-Miles	Express Ton-Miles	Freight Ton-Miles	Total Rev. Ton-Miles (000)
1945	4,452	1,312	52.78	74,510	11,482	....	202
1946	25,118	6,812	37.92	60,088	24,354	25	688
1947	235,585	46,418	29.85	167,564	117,523	62,039	4,682
1948	425,695	87,928	27.14	361,984	189,550	264,794	9,040
1949	683,811	136,560	28.47	432,628	320,143	435,993	14,328
1950	987,931	200,903	33.07	559,085	614,139	714,346	21,480
1951	1,462,083	291,296	38.20	765,456	864,946	884,417	30,709
1952	1,703,730	336,919	38.64	893,057	866,526	1,081,319	35,130
1953	1,998,128	386,881	39.49	976,003	927,571	1,149,905	39,626

more than two-thirds of the local carrier mail pay need. Had it been physically possible (as it is not) for local carriers to achieve the average trunk passenger haul of 541 miles, passenger revenues for the local carriers would have increased $38 millions.

Trend of Local Service Performance

In order to evaluate the foregoing discussion, it is necessary to briefly consider local service performance *trends* since 1947. For example, volume of service as represented by revenue miles flown, expanded greatly from 1947 to 1951 but has continued to grow since then at a slower rate. Density of traffic, as represented by load factors, expanded from 1947 to 1950 but has since leveled off. Passenger revenues in relation to mail revenues have doubled since 1947, but the adjusted mail revenue per mile as a percentage of total revenue has become substantially stabilized since 1951. Leveling off of these trends is an important reason why action should be taken to improve local carrier commercial revenues. This is emphasized even more when it is realized that unit costs which declined until 1951 have since turned upward as a result of rising price levels and labor costs.

Consequently the industry has been faced with mounting deficits. The impact of continued losses has subjected the industry to severe financial strain and restricted its ability to attract capital. In the four years between 1949 and 1953, current liabilities expanded from 34% to 48% of assets and have been almost the sole source of financing expansion — an inappropriate use of that class of credit. During 1953 the industry lost $1.8 millions and the total of $12 millions in equity capital which had been paid into the industry was impaired to the extent of an accumulated deficit of over $2 millions in "earned surplus." Obviously, something must be done.

The solution lies in an upgrading of revenues and net profits through modifications of the route restrictions along the two lines discussed below.

Local Service Airlines Operating Expenses, 1946-1953

Year	Aircraft Operating Expenses	Per Cent of Total	Ground and Indirect Expenses	Per Cent of Total	Total Operating Expenses
1946	$ 999,175	48.49	$ 1,064,254	51.65	$ 2,060,429
1947	4,462,227	49.20	4,607,078	50.80	9,069,305
1948	8,321,371	52.26	7,602,141	47.74	15,923,512
1949	11,810,777	52.77	10,570,938	47.23	22,381,715
1950	13,453,647	49.25	13,863,096	50.75	27,316,743
1951	16,515,791	47.11	18,541,583	52.89	35,057,373
1952	20,525,950	48.32	21,956,303	51.68	42,482,253
1953	24,146,964	48.63	25,502,742	51.37	49,649,706

Local Service Airlines Direct Operating Expenses, 1946-1953

Year	Flying Operations	Per Cent of Total	Dir. Maint. Flight Equipment	Per Cent of Total	Depreciation Flight Equipment	Per Cent of Total
1946	$ 497,438	24.14	$ 347,727	16.88	$ 151,010	7.33
1947	2,203,155	24.29	1,336,677	14.74	922,395	10.17
1948	4,526,827	28.43	2,348,309	14.75	1,446,234	9.08
1949	6,486,969	28.91	3,280,965	14.66	2,042,843	9.13
1950	8,482,742	31.05	3,476,759	12.73	1,494,146	5.47
1951	10,684,089	30.48	4,216,070	12.02	1,615,632	4.61
1952	13,107,080	30.85	5,348,387	12.59	2,070,483	4.88
1953	15,388,367	30.99	6,337,220	12.76	2,421,377	4.88

—Tables by Ray & Ray, Consultants.

Local Terminal-to-Terminal Traffic

Local carrier route restrictions should be revised to permit terminal-to-terminal non-stop operation, or one-stop service between such terminals, *where the circumstances warrant such revision.* Local carrier cer-

(Continued on page 53)

Local Service Airlines Route Pattern Data

Carrier	1950 Population Served	No. of Stops	Local Service Only 1950 Pop. Served	Local Service Only No. of Stops	Undup. Route Mi. Operated	Avg. Pop. Per Stop System	Avg. Pop. Per Stop Local Serv. Only	Per Cent System Local Serv. Pop.	Per Cent System Only Stops	No. of Segments	Avg. Length of Segment	Pop. Per Route Mi.
Allegheny	15,821,141	30	402,727	12	2,216	527,371	33,561	2.55	40	37	59.9	7,140
Bonanza	2,573,086	15	100,499	10	1,315	171,539	10,050	3.91	67	15	87.7	1,957
Central	1,685,888	21	192,425	10	1,408	80,280	19,243	11.41	48	23	61.2	1,197
Frontier	1,281,168	34	138,058	23	3,417	37,681	6,003	10.78	68	39	87.6	375
Lake Central	7,841,459	21	559,479	10	1,305	373,403	55,948	7.13	48	23	56.7	6,009
Mohawk	11,365,929	15	193,432	3	1,149	757,728	64,477	1.70	20	17	67.6	9,892
North Central	8,057,297	34	686,516	25	2,691	236,979	27,461	8.52	74	39	69.0	2,994
Ozark	7,983,387	32	380,717	13	2,090	249,481	29,286	4.77	41	33	63.3	3,820
Piedmont	2,701,779	26	152,991	7	2,480	103,915	21,856	5.66	27	33	75.2	1,089
Pioneer	2,086,427	21	185,752	10	1,850	99,354	18,575	8.90	48	23	80.4	1,128
Southern	2,971,359	29	306,646	13	2,135	102,461	23,588	10.32	45	32	66.7	1,392
Southwest	3,662,218	23	377,021	18	1,136	159,227	20,946	10.29	78	23	49.4	3,224
Trans-Texas	3,475,311	39	343,894	22	3,207	89,111	15,632	9.90	56	44	72.9	1,084
West Coast	1,535,142	32	291,439	19	2,221	47,973	15,339	18.98	59	35	63.5	691
Undup. Total	47,371,360	339	4,278,805	193	28,469	139,739	22,170	9.03	57	412	69.1	1,664
Undup. Total, 1952	43,375,460	330	4,232,143	188	26,245	131,441	22,511	9.76	57	393	66.8	1,653

—Table by Ray & Ray, Consultants.

First-Class Mail by Air

Local service carriers lead the way in experiments which may lead to full-scale service

By DONALD W. NYROP

Washington Counsel, Conference of Local Airlines; Former Chairman, Civil Aeronautics Board

THE Fiftieth Anniversary of Powered Flight — December 17, 1953 — was an historic day in aviation: the day witnessed the beginning of the first-class-mail-by-air Christmas experiment by the fourteen local airlines — one of the most promising avenues for public service and additional revenue inaugurated by them.

Highly successful from the standpoint of the public, the Post Office Department, the Civil Aeronautics Board and the carriers, this eight-day special airlift appears to be the forerunner to a full-scale first-class-mail-by-air policy at many of the small and intermediate communities in the country.

The idea of expediting mail service through air transportation has been discussed for many years. Canada started flying all first-class mail after the war, and experience there has been closely watched in the United States. Last fall the Post Office Department started flying first-class mail on two major trunk routes — New York-Chicago and Washington-Chicago.

Locals Originated Christmas Plan

Last year officials of the local service airlines began discussing the idea with the Post Office Department and the Civil Aeronautics Board. From these discussions it was clear from the beginning that there were many areas where transporting the mails by air would offer significant savings in time and money. Where cities were linked with infrequent rail service requiring circuitous routing and multiple handling of the mail, and the amount of mail was relatively small, the savings in sending all the mail by air were obvious. In other situations, the local airlines felt that they could offer faster and cheaper service, but the potential savings could not be estimated clearly in the absence of actual operating experience. In connection with transporting the mail by air on the New York-Chicago and Washington-Chicago routes, the Post Office Department had made special mail studies before service began. Because of the number of route segments involved, the time and cost of similar surveys for service on the local airlines would have been tremendous. Since the local airlines had unused space available, and since the revenue would inure to the benefit of the Government in the form of reduced subsidy, rather than to the airlines, the local airlines felt extensive surveys were unnecessary.

To meet this problem by obtaining actual operating experience, and at the same time to help out the Post Office Department with its annual Christmas rush, the local airlines offered to carry the mail during the Christmas period over nearly all their routes. On December 11, 1953, the fourteen carriers each petitioned the Civil Aeronautics Board for the establishment of a mail rate for the transportation of preferential mail (first-class, newspapers, special handling and special delivery parcel post) and other classes of mail other than air mail. A rate of compensation of 30 cents per ton-mile was proposed.

Three days later, Assistant Postmaster General for Transportation John C. Allen wrote to the Civil Aeronautics Board, stating that the proposal was desirable from the standpoint of the public interest and the "services could be used by the Department to advantage in implementing the President's directive to improve the mail service." He said further:

"They could be used on the economical space-available basis in those instances, emergency in nature, where the movement of surface mail would otherwise be delayed due to bottlenecks, pile-ups at various points, adverse weather conditions, stoppages, unusual delays in other media of transportation or other unusual circumstances. These services could also be used in pilot tests of a limited nature over segments, for which service is being offered by these carriers, where in the judgment of the Postmaster General, additional information can thus be obtained as to the advisability of expanding the air program."

The Civil Aeronautics Board approved the rate, and on December 17, 1953, first-class and other preferential mail started moving by air. For eight days the unique airlift continued, and when it was over a significant new chapter in aviation history had been written.

During the eight-day period, the local airlines carried 433,342 pounds of mail, representing 49,355 ton-miles. Some idea of the magnitude here in-

volved can be seen when this figure is compared with the trunkline operation on the route from Washington to Chicago. From October 6 until the end of December, the trunks carried 454,941 pounds of mail. The local service airlines carried almost that much poundage in *eight* days.

Big Dividends to Public

Cost-wise, the experiment proved highly rewarding to the Post Office. The most recent Post Office Cost Ascertainment Report, for fiscal year 1952, shows that out of every revenue dollar received by the Post Office, 20.8 cents goes for transportation. The local airlines received 2.84 cents out of each revenue dollar received for the mail carried by them during the eight-day Christmas experiment.

The Post Office Department estimates that the mail moving during this period averaged about 40 letters to the pound, or, at 3 cents per letter, $1.20 per pound. On this basis, the Post Office received approximately $520,000 for the mail carried by the local airlines at a cost of $14,806.

The savings in time are more difficult to determine but were equally impressive. In the areas served by the local airlines, the normal Christmas pile up of mail didn't occur, and in most cases nearly all the mail was delivered prior to Christmas.

Some examples of the time and distance saved are the following: Surface mail moving between Reno and Las Vegas takes approximately 11 hours to move the 451-mile distance. Bonanza Airlines flew the surface mail in two hours and fifty minutes. Surface mail from Medford, Oregon, and points

(Continued on page 42)

Results of Local Service Mail Experiment

THE historic Christmas airlift by 14 local service airlines resulted in 500,000 lbs. of first-class mail being flown from hundreds of small cities. It was so successful that first-class-mail-by-air may well become a year-round service — three local service carriers are now continuing the service as an experiment for future planning by the Post Office Department.

The following tabulation of the Christmas airlift by cities and carriers provides an interesting study of service possibilities opened to the public by the experiment:

ALLEGHENY AIRLINES, 34,281 lbs.; 5,064,000-lb.-miles; 2,532 ton-miles, pounds originated as follows: Altoona 46, Asbury Park 93, Bradford 220, Buffalo 837, Butler 37, Cleveland 1,893, Cumberland 223, Erie 307, Hagerstown 1,356, Harrisburg 4, Huntington 1,356, Johnstown 460, Lock Haven 67, Newark 5,434, Parkersburg 1,288, Philadelphia 639, Philipsburg 325, Pittsburgh 6,096, Scranton-Wilkes Barre 8,293, Washington 1,734, Wheeling 468, Williamsport 2,157 and Wilmington 18.

BONANZA AIR LINES, 3,615 lbs.; 643,470-lb.-miles; 324 ton-miles; pounds originated as follows: Reno 220, Hawthorne 474, Tonopah 124, Las Vegas 707, Kingman 209, Prescott 244, Phoenix 792, Ajo 126, Blythe 13, Yuma 146, El Centro 79, San Diego 305 and Los Angeles 174.

CENTRAL AIRLINES, 35,867 lbs.; 6,600,000 lb.-miles; 3,300 ton-miles; pounds originated as follows: Wichita 89, Amarillo 1,073, Borger 601, Woodward 382, Ponca City 2,511, Enid 2,436, Bartlesville 2,436, Tulsa 7,196, Stillwater 951, Shawnee 605, Oklahoma City 3,049, Ada 658, Chickasha 180, Lawton 3,476, Muskogee 2,412, McAlester 957, Paris 902, Ardmore 584, Dallas 2,896 and Ft. Worth 3,550.

FRONTIER AIRLINES, 32,979 lbs.; 10,504,000 lb.-miles; 5,257 ton-miles; pounds originated as follows: Alamosa 1,100, Albuquerque 430, Billings 1,090, Casper 103, Cheyenne 584, Cody 1,178, Denver 8,823, Durango 2,190, El Paso 228, Farmington 1,292, Flagstaff 1,823, Gallup 702, Grand Junction 376, Greybull 570, Laramie 1,017, Monte Vista 107, Phoenix 3,286, Powell 508, Prescott 1,537, Pueblo 2,906, Rawlins 515, Riverton 817, Safford 22, Salt Lake City 32, Silver City 349, Winslow 434 and Worland 968.

LAKE CENTRAL AIRLINES, 5,118 lbs.; 588,000 lb.-miles; 294 ton-miles; pounds originated as follows: Lafayette 766, Kokomo 975, Dayton 11, Springfield 69, Dover-New Philadelphia 123, Grand Rapids 182, Kalamazoo 171, South Bend 622, Indianapolis 1,571, Bloomington 133, Cleveland 159 and Youngstown 336.

MOHAWK AIRLINES, 32,405 lbs.; 3,934,000 lb.-miles; 2,387 ton-miles; pounds originated as follows: Binghamton 8,745, Ithaca 5,424, Newark 4,548, Boston 4,488, Westfield-Springfield 1,802, Buffalo 1,499, Syracuse 1,412, Elmira 1,263, Watertown 1,078, Utica 940, Pittsfield 475, Albany 424, Worcester 218 and Rochester 89.

NORTH CENTRAL AIRLINES, 37,989 lbs.; 8,174,000 lb.-miles; 4,087 ton-miles; pounds originated as follows: Alexandria 502, Bemidji 349, Brainerd 643, Clintonville 80, Detroit 3,166, Duluth-Superior 6,384, Eau Claire-Chippewa Falls 1,212, Escanaba 772, Fargo 323, Fergus Falls 1,057, Grand Forks 205, Grand Rapids 111, Green Bay 3,916, Hibbing 563, Hancock-Houghton 1,052, Iron Mountain 345, Ironwood 376, LaCrosse 722, Manitowoc 517, Marquette 1,349, Marinette-Menominee 430, Milwaukee 2,269, Minneapolis-St. Paul 5,602, Oshkosh 1,608, Rhinelander 602, St. Cloud 216, Stevens Point-Wisconsin Rapids 1,030, Thief River Falls 304, Wasau 2,194 and Winona 90.

OZARK AIR LINES, 4,221 lbs.; 502,000 lb.-miles; 251 ton-miles; pounds originated as follows: Bartlesville 69, Burlington 25, Champaign 329, Chanute 45, Columbia 156, Danville 211, Decatur 2,206, Indianapolis 92, Joplin 127, Keokuk 11, Miami 36, Moline 78, Peoria 190, Pittsburg 49, Quincy 16, Springfield (Ill.) 338, Springfield (Mo.) 49, Topeka 29, Tulsa 95 and Wichita 70.

PIEDMONT AIRLINES, 41,818 lbs.; 14,092,000 lb.-miles; 7,046 ton-miles; pounds originated as follows: Cincinnati 17,887, Louisville 1,127, Tri Cities 560, Knoxville 291, Charleston 292, Lynchburg 626, Roanoke 417, Richmond 553, Newport News 2,335, Huntington 2,185, Norfolk 4,063, Kinston 143, London-Corbin 12, Winston-Salem 848, Greensboro 1,207, New Bern 168, Hickory 81, Asheville 626, Fayetteville 839, Wilmington 1,353, Lexington 2.290, Raleigh-Durham 1,179, and Charlotte 2,736.

PIONEER AIR LINES, 68,216 lbs.; 18,676,000 lb.-miles; 9,533 ton-miles; pounds originated as follows: Abilene 2,624, Albuquerque 2,268, Amarillo 4,632, Austin 5,396, Big Spring 1,423, Breckenridge 363, College Station-Bryan 1,413, Clovis 873, Dallas 9,732, Ft. Worth 5,218, Houston 6,179, Lubbock 12,078, Midland-Odessa 5,881, Mineral Wells 740, Plainview 1,603, San Angelo 2,051, Santa Fe 920, Snyder 842, Sweetwater 343, Temple 522 and Waco 3,115.

SOUTHERN AIRWAYS, 36,844 lbs.; 6,016,000 lb.-miles; 3,009 ton-miles; pounds originated as follows: Atlanta 7,177, Athens 406, Greenwood 30, Greenville (S. C.) 1,192, Spartanburg 106, Charlotte 333, LaGrange 199, Columbus (Ga.) 1,782, Albany 890, Moultrie 286, Valdosta 224, Jacksonville 275, Gadsden 700, Birmingham 3,403, Tuscaloosa 2,121, Columbus (Miss.) 3,166, Tupelo 208, Memphis 717, Clarksdale 11, Greenville (Miss.) 1,188, Vicksburg 522, Monroe 836, Natchez 245, Baton Rouge 2,256, New Orleans 4,733, Jackson 1,618, Laurel 207, Gulfport-Biloxi 352 and Mobile 469.

SOUTHWEST AIRWAYS, 27,411 lbs.; 4,822,000 lb.-miles; 2,412 ton-miles; pounds originated as follows: Los Angeles 6,161, Oxnard 2,583, Santa Barbara 1,919, Santa Maria 967, Paso Robles 468, Monterey 1,297, Watsonville 951, San Jose 1,834, San Francisco 4,324, Sacramento 387, Marysville 343, Chico 470, Red Bluff 210, Redding 837, Yreka 150, San Francisco 165, Oakland 266, Medford 12, Santa Rosa 284, Ukiah 110, Eureka 2,850, Crescent City 299, Medford 166 and Oakland 358.

TRANS-TEXAS AIRWAYS, 70,714 lbs.; 17,400,000 lb.-miles; 8,700 ton-miles; pounds originated as follows: Austin 2,747, Beaumont 1,746, Beeville 111, Brownwood 1,025, College Station-Bryan 1,014, Camden 55, Corpus Christi 6,406, Dallas 11,003, Del Rio 426, Eagle Pass 406, El Dorado 362, El Paso 2,188, Ft. Stockton 2,715, Ft. Worth 3,193, Galveston 1,296, Harlingen 1,882, Helena 188, Hot Springs 116, Magnolia 165, Houston 4,835, Little Rock 1,671, Longview 1,957, Lufkin 1,194, Marfa-Alpine 222, Marshall 344, McAllen-Mission-Edinburg 1,150, Memphis 1,102, Pecos 180, Pine Bluff 874, San Angelo 4,037, San Antonio 4,099, Shreveport 263, Stuttgart 1,176, Texarkana 2,943, Tyler 5,473, Uvalde 1,222 and Victoria 928.

WEST COAST AIRLINES, 2,090 lbs.; 440,000 lb.-miles; 222 ton-miles; origination not given. ★ ★ ★

This Mohawk Airlines photo poses the old and the new in local service equipment, being one of its DC-3's at top and its new Sikorsky S-55 helicopter. The Sikorsky is outfitted for 8 passengers and will operate between city centers from heliports instead of outlying airports.

Mohawk Takes the Big Step

By CARL A. BENSCOTER
Vice President — Operations
Mohawk Airlines, Inc.

LAST summer, it was announced that Mohawk Airlines plans to replace its fleet of DC-3 aircraft with multi-engine transport helicopters. This statement was given added significance on April 26 when Mohawk accepted delivery of a brand-new Sikorsky S-55 helicopter. Mohawk has taken the initial big step toward helicopter equipment, and it is the first local service airline to operate a helicopter.

Tremendous public interest in Mohawk's S-55 was demonstrated by telephone calls and letters following the announcement, and it is interesting to note that officials of several cities immediately expressed their deep interest in securing helicopter service for their communities at the earliest possible date.

The purchase of this helicopter marks only the first phase of Mohawk's carefully-developed program of providing not only greatly improved transportation for the public served by its routes throughout a densely populated and industrial area, but a means by which this rapidly growing local service airline can achieve its prime objective of self-sufficiency.

$19.80 for 82-Mi. Hop

Mohawk is fully aware of the record of helicopter operating costs, and it does not anticipate a profit in its operation of the S-55. The helicopter will be operated as an investment in Mohawk's future re-equipment program. It will provide thorough training of its pilot and maintenance personnel in helicopter operations and it will be the means of developing certain procedures and equipment closely related to the success of future large multi-engine transport helicopters, as well as the best methods of making the transition from fixed-wing to rotary-wing scheduling and traffic.

Mohawk will operate its Sikorsky S-55 on an 82-mile route between New York-Newark and Liberty-Monticello. This decision is somewhat historic in the field of scheduled air transportation. For some time Mohawk has been certificated to serve Liberty-Monticello, New York. These vacation-land communities are located in the heart of the Catskill Mountains, and development of an airport large enough to accommodate scheduled DC-3 operations would be exceedingly expensive. Inauguration of scheduled air service to Liberty-Monticello is the first application of the helicopter in providing air transportation to a community, originally certificated for fixed-wing service, which could not be accomplished with the transport airplane because of the lack of adequate airport facilities.

Helicopter schedules between New York-Newark and Liberty-Monticello will be completed in slightly less than one hour, and the 82-mile trip will be the longest scheduled non-stop helicopter flight operated in the United States. One-way passenger fare over this route will be $19.80 including tax, or about 24 cents per mile, the lowest rate as yet charged for helicopter passenger flights in this country.

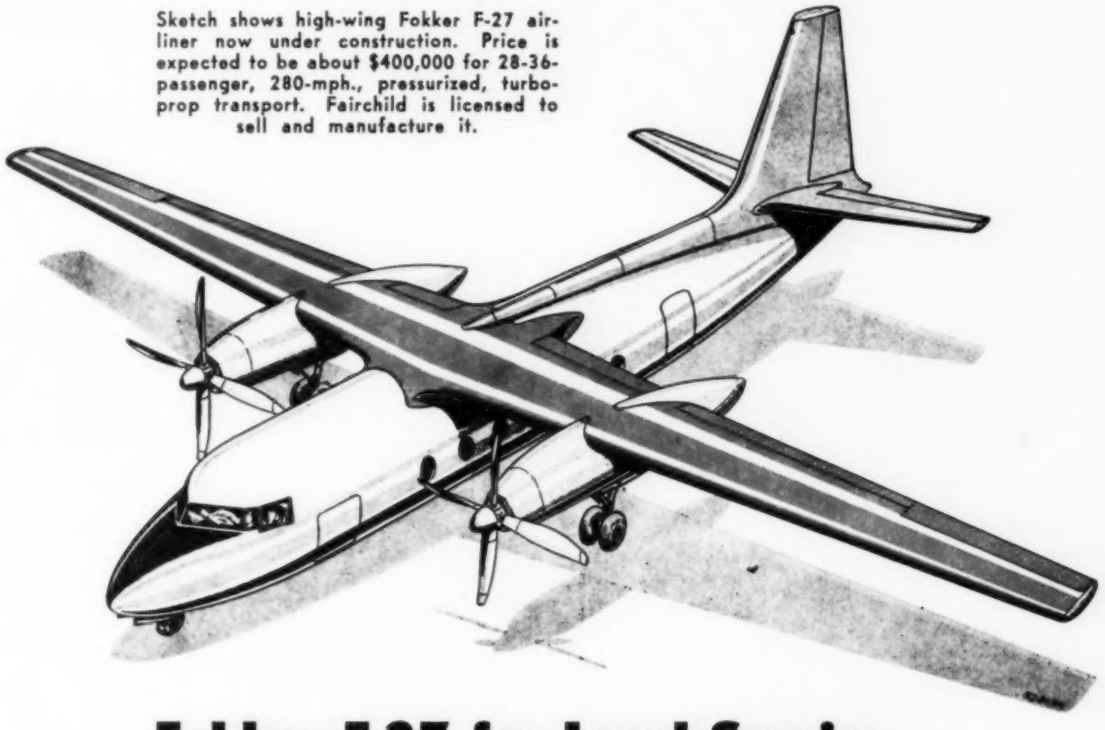
Airline Modification for S-55

Preparation for Mohawk's helicopter operation has been extensive, and it has been necessary to work out many problems. Although the S-55 is an excellent helicopter, it does not have sufficient space or pay load for really successful airline operations. Accordingly, a great deal of planning was required to adapt a military aircraft

to the necessary configuration for passenger service, and in this respect the co-operation of Sikorsky personnel proved very helpful.

Study of the standard S-55 military model reveals that its empty weight can be reduced in several ways, and in this manner it was found possible for the first time, at least in an operation conducted in the United States, to install 8 passenger seats with extra weight capacity to accommodate a moderate amount of baggage and mail. Usually, the S-55 is equipped with 7 seats, and the addition of one more seat substantially reduces available seat-mile costs.

The military requirement of about 37 pounds of electronic inverters to operate the fuel system and other equipment was replaced by a 4-pound inverter and a 4-pound engine accessory pump. The use of battery carts for external starting power permitted installation of a lighter-weight battery. Rear fuel cells, equipment racks, and miscellaneous military fittings



Sketch shows high-wing Fokker F-27 airliner now under construction. Price is expected to be about $400,000 for 28-36-passenger, 280-mph., pressurized, turboprop transport. Fairchild is licensed to sell and manufacture it.

Fokker F-27 for Local Service

FIRST details have been disclosed of a DC-3 replacement design by Fokker Aircraft Company in Holland and its availability through Fairchild Engine & Aircraft Corp., of Hagerstown, Maryland.

James G. Ray, representing Fairchild in a study for a DC-3 replacement, appeared before the Senate Interstate & Foreign Commerce committee on May 18 and pictured the new Fokker F-27 as having brightened the outlook of the local service carriers for a modern new transport. He said two prototypes are under construction in Holland with many of the parts already fabricated and with the Dutch government paying for their production. They are scheduled to fly early in 1955. Fairchild, which represents Fokker for sales and service in the Western hemisphere, will bring one of the prototypes to America for certification and demonstrations to U. S. air carriers. First sales will be made from Dutch production but Fairchild intends to set up U. S. production for the F-27 as soon as the market justifies.

He described the 28-36-passenger Fokker F-27 as "a very good DC-3 replacement," with preliminary studies indicating its seat-mile and ton-mile costs will be lower than for a DC-3.

The Fokker has about the same span and a little more length than the Douglas but embodies improvements over the 20-year-old DC-3 design which enables it to carry considerably more payload and to cruise about 80 mph. faster with a pressurized cabin and tricycle landing gear. It is powered by two Rolls-Royce Dart turbo-prop engines, a type with considerable service in the British Viscount airliner. Ray said no price has been quoted but that the Fokker F-27 is expected to sell at about $400,000.

Fokker specifications and performance data for the F-27 includes the following:

Span, ft.	95	Cr. Spd. at 20,000 ft., mph.	266
Length, ft.	73	SL R/C, fpm.	1,500
Height, ft.-ins.	26-6	Svc. Clng., ft.	35,000
Wing Area, sq. ft.	754	SE Clng., ft.	12,500
TO Wt., lbs.	32,630	Norm. Stage Length, mi.	300
Empty Wt., lbs.	20,610	Max. Stage Length, mi.	830
Power Plants: Two Rolls-Royce Dart turbo-prop engines, 1,540 shp. plus 365 lbs. thrust each.		ICAO Take-off Dist., ft.	2,400
Top Spd. at 20,000 ft., mph.	280		

A Fokker example of flight planning for a 300-mi. stage based on SBAC standards is as follows:

	Time Mins.	Distance St. Miles	Fuel Lbs.
Starting, Taxiing and Final Check	——	——	130
Take-off	1	——	40
Climb to 20,000 ft.	19.5	54.5	510
Cruise	34.5	153.5	670
Descent to 1,000 ft.	23.5	92	315
Pattern and landing	10	——	190
Taxiing	——	——	60
Contingencies	——	——	30
Totals	88.5	300	1,945

Study Seeks Air Traffic Formula

ROUTE patterns developed for local and trunk air service have evolved through trial and error and the absence of a valid traffic forecasting formula has perplexed carrier and government officials for years. But something is now being done to remedy the situation as a result of action taken by Dr. R. B. Stewart, Purdue University vice president and treasurer, who last year became president of Lake Central Airlines, a local carrier.

The problem of originating a formula for the airlines was given to the economics department at Purdue and this department assigned the project to one of their leading graduate students in economics, Harley H. Hinrichs. He accepted it as the subject for a doctorate thesis and collected and compiled facts for eight months, discussing the problems with the economics and research staffs of both the university and Lake Central Airlines. Hinrichs came up with a "multiple-causation" formula. His report has been under exhaustive analysis by experts. Dr. Emanuel Weiler, formerly with the New York Port Authority, economics chairman at the university, verified the value of the Hinrichs' formula and urged further development and testing, with other universities participating to prove its application and usefulness in many areas of the nation as well as in the Lake Central area. Universities in Indiana, Ohio and Michigan have already joined in the study.

To quote directly from the report, the formula concept would be valuable for several uses. They are: (1) To set up a route system and/or route segment; (2) to provide rational, unbiased documentation in dealing with community groups, chambers of commerce and so forth, and (3) to provide evidence in CAB cases.

The specific purpose of the formula study is to provide an accurate forecast of airline traffic generation and flow direction before any service is inaugurated. To quote further from the report, possible uses of the formula are as follows:

1. To compare the potential traffic between one city and a number of cities, answering questions like: "Where would most of the air traffic emanating from Lima, Ohio, go?"

2. To compare the traffic potentials of any pairs of cities within homogeneous regions. For example, in answering the question: "Would there be more traffic between Indianapolis and Evansville or between Columbus and Charleston?"

3. To compare the traffic potentials of any pairs of cities anywhere, answering the question: "Would there be more traffic between Las Vegas and Los Angeles or Chicago and Des Moines?"

4. To determine the air traffic generation capacity of cities. For example: "Would Muncie or Kokomo generate more air traffic?"

5. To forecast future potential or actual traffic figures.

It is explained by Lake Central Airlines, which is serving as the "pilot plant" for the study, and by Purdue officials, who are directing the research, that the "multiple-causation" formula's basic concept is that no two cities are alike in every respect. The formula would determine differing characteristics among cities and apply to them a "value of effect." Research personnel at universities in Ohio, Indiana and Michigan are convinced that further investigation of these concepts will result in more accurate methods of evaluating route structures and route patterns. The goal is development of a more profitable and workable route and segment structure for the air transportation system.

Dr. Stewart presented the program to local carrier officials and state aeronautics directors at Louisville last month during the American Association of Airport Executives meeting. The group's committee on local airlines voted to adopt and further investigate Dr. Stewart's proposal.★★

were cut out, and an adequate baggage compartment was arranged in the aft end of the fuselage with a large external door for easy loading. Standard radio equipment in the S-55 weighs 40 pounds, and some of the above saving in weight was "spent" in the installation of standard airline transmitter and receiver units to assure excellent communications.

Mohawk's S-55 was delivered without soundproofing, upholstery and seats, and the entire cabin interior was completed in the company shops at Ithaca. In this respect, Mohawk's experience in completely refurbishing the interiors of its DC-3's proved valuable. Ample thicknesses of fibreglass insulation were used to reduce interior noise, and specially designed bulkheads were installed to seal off engine noise from the cabin. Practical-finish upholstery on cabin walls and ceiling in harmonizing colors was used to match the interior design of its DC-3's which has proved to be very popular with passengers.

Passenger seats were specially designed and constructed to Mohawk's order by Aerosmith of Miami. These seats are of unusually lightweight design with back and head rests at the proper angle to assure passenger comfort, while foam rubber seat and back cushions impart an air of luxurious ease. In addition, a public address system was installed in the ceiling of the cabin so that the pilot can speak to the passengers when desired, and a signal light and hand telephone permits any passenger to talk with the pilot. This passenger convenience is highly desirable because of over-all weights preclude the use of a cabin attendant.

Mohawk has employed Capt. Gustav Crawford as its senior helicopter pilot. For many years Capt. Crawford has been head of the Aviation Bureau of the New York Police Department. He has approximately 1,000 hours of helicopter time, has received several citations and decorations for heroism in helicopter rescue work, and is widely known as an excellent helicopter pilot. Capt. Crawford will be responsible for the thorough training of Mohawk's experienced airline pilots in operation of the helicopter, and Mohawk firmly believes that the combination of extensive airline piloting skill with the ability to fly helicopters will result in an exceptionally high level of safety in operations.

Three of Mohawk's top airline mechanics received a month's training at the Sikorsky helicopter maintenance school, and these men, in turn, will train other Mohawk mechanics in inspection, maintenance and overhaul procedures for helicopters. With Capt. Crawford as the only additional employe to be utilized in its extensive training, operating and transition program, this procedure is consistent with Mohawk's established policy of training and advancing its employes who have helped to build a successful organization for local service air transportation.

In addition to the installation of airline radio transmitter and receiver units in the S-55 helicopter, company communications are being expanded for the helicopter route by the installation of a teletype drop and radio transmitter at the Liberty-Monticello station. In this manner, the usual high standards of airline weather reporting and communications are being main-

(Continued on page 54)

STRONG and GROWING

Pioneer Air Lines nears 10th year of service with highest load factor in its history!

Pioneer, the nation's oldest local service airline, will celebrate the beginning of its 10th year of service on August 1, 1954. Pioneer celebrates with just cause, for this year it has passed many milestones of progress in growth and service.

Pioneer's load factor of 53.8 during the month of May, 1954 was the highest in its history. And during the first five months of 1954, Pioneer's load factor averaged 49.88.

Two other important goals will be reached this summer, when Pioneer will board its *one-millionth* passenger — and will have flown more than *270 million* revenue passenger miles on scheduled operations — without a fatal accident or injury to either passenger or crew member.

This year, as it has every year, Pioneer received the National Safety Council's Safety Award — 9 Safety Awards in 9 years of service. Pioneer celebrates also one of the highest completion of schedule and on time performance records in the industry.

Pioneer Air Lines began operation on August 1, 1945, serving six cities over a 683 mile system. Today, Pioneer serves 23 key Southwestern cities over a 2,000 mile system. The record speaks for itself — Pioneer is strong and **growing.**

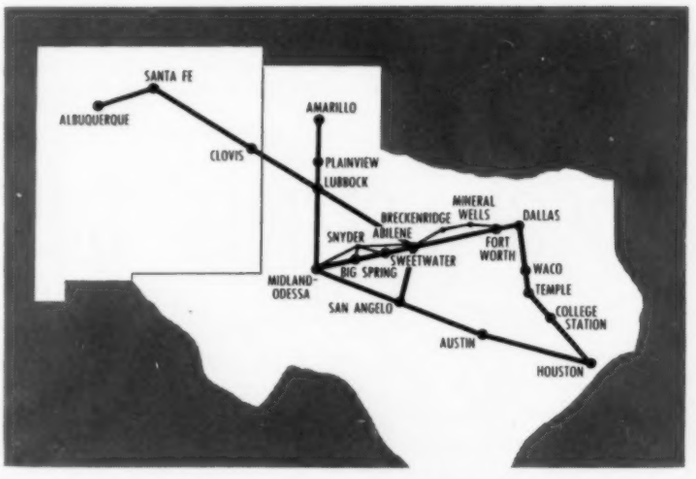
And the Pioneer service will grow more. Because Pioneer serves a dynamic territory — with a population of over 2½ million whose needs are great and growing. And Pioneer is determined to make its services more efficient, more useful and more pleasing to everyone, both old customers and new.

Evidence that Pioneer will achieve these performance and service goals is found in the optimistic and enthusiastic attitude of the entire Pioneer family — and in the Pioneer sales slogan for 1954 — "Sales Will Soar in '54!"

PIONEER

AIR LINES

Pioneer serves the Southwest with a fleet of dependable DC-3's — workhorses of the industry.

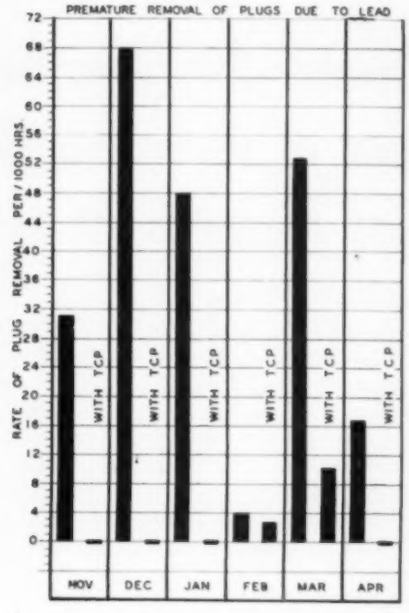


The Southwest is near when you fly Pioneer — serving 23 key Southwestern cities over a 2,000 mile system — an area with a growing population of over 2½ million.

In ten of the cities it serves, Pioneer has been a leading factor in helping those cities build new, modern airport and terminal facilities to accommodate their increasing air travel needs.

At the end of a 6-month operations test, a Lake Central Airlines Pratt & Whitney R-1830-90D engine was torn down for a 1,000-hr. inspection. Shown at the tear-down at Dallas Airmotive are (left to right) George Norman of Ozark Airlines, George Stubbs of Lake Central, Carl Bransford and Hugh Harvey of Shell Oil, Herbert Wright of Dallas Airmotive and David Vaughn of Central Airlines.
—(Lake Central Airlines Photo.)

On chart of six-month test, bars show rate of spark plug removals due to lead. On two DC-3's using TCP, only 5 plugs suffered lead fouling while five other DC-3's not using TCP needed 221 spark plug changes due to lead.



Local Carriers Cost Conscious

Lake Central test with TCP indicates $6,000 annual saving

ANOTHER advance in the battle against the high operating costs inherent in local air service has been made by Lake Central Airlines which has completed a successful six months test of the effectiveness of the new Shell fuel additive, TCP, in reducing premature spark plug removals.

The climax of this study came on April 27 when representatives from Lake Central Airlines, Shell Oil Company, Ozark Airlines, Pratt & Whitney, Braniff International Airways, Central Airlines, TACA International Airlines, and the Civil Aeronautics Administration, met to witness the 1,000-hour inspection of two Lake Central engines which had been run on fuel containing TCP during this period. The inspection was made at Dallas Airmotive, Inc., Dallas, Texas, where Lake Central sends its engines for major overhauls.

Lake Central Airlines' records show that 70% of the premature spark plug removals on its R-1830-90D engines were due to lead fouling. According to George Stubbs, superintendent of maintenance for the local service carrier, "The control test involving two DC-3's of Lake Central's seven ship fleet has given clear indication that the severe spark plug fouling encountered in short haul service can be reduced materially by the inclusion of TCP in the gasoline.

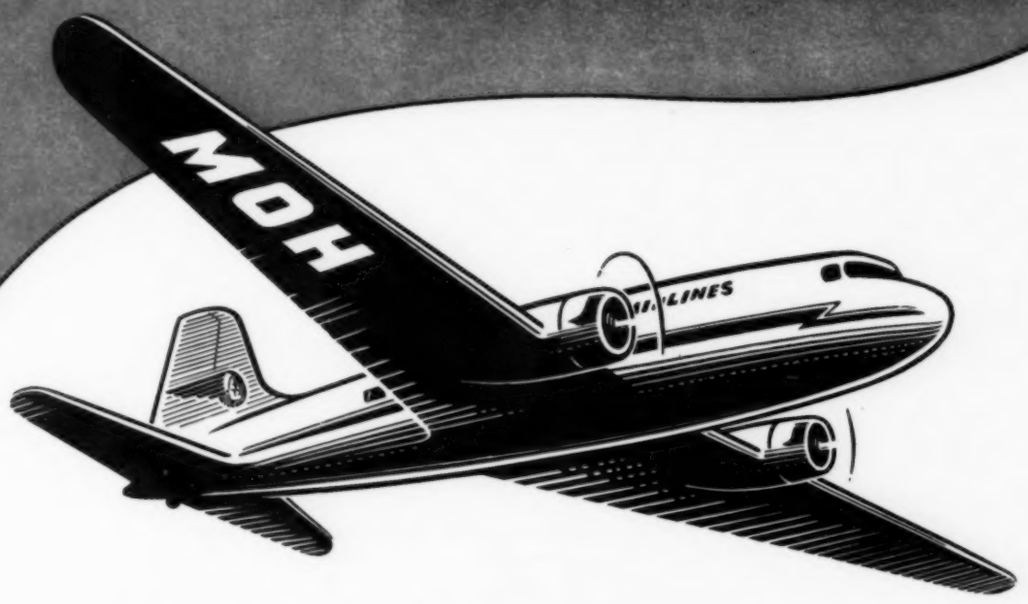
"During the six months duration of the study, Lake Central found only 5 spark plugs suffering from lead fouling on the two aircraft using TCP. The remaining five aircraft not using TCP needed a total of 221 premature spark plug changes because of lead fouling. Dollar-wise, the cost of making the plug changes amounted to approximately $600 for spark plugs against a total cost for TCP of $150."

"Further savings in spark plug costs result from the use of TCP," Stubbs pointed out. "The plugs from engines run on TCP are readily cleaned by a light sand blast since the deposits are soft and powdery. The net effect is that spark plug life is increased by 33⅓%. These savings and the increased passenger revenues realized from the elimination of delays can result in total savings of approximately $6,000 a year for Lake Central."

Reaction of pilots to TCP has been favorable, captains reporting that they find the engines using TCP generally smoother. Magneto checks are less severe when TCP is used, only moderate power being required and "burn-out" procedures being unnecessary, Lake Central has found.

The engine tear-down at Dallas Airmotive was closely watched by all those in attendance to detect any signs of ill effects from the use of TCP. Pratt & Whitney's representative, Walter Holloway, stated at the conclusion of the inspection that, in his opinion, "This inspection bears out the contention that the use of TCP as a fuel additive causes no perceptible damage to any part of the aircraft engine."

Because of the conclusive evidence gained, Lake Central Airlines intends to include TCP in all the fuel used by its aircraft. ★ ★ ★

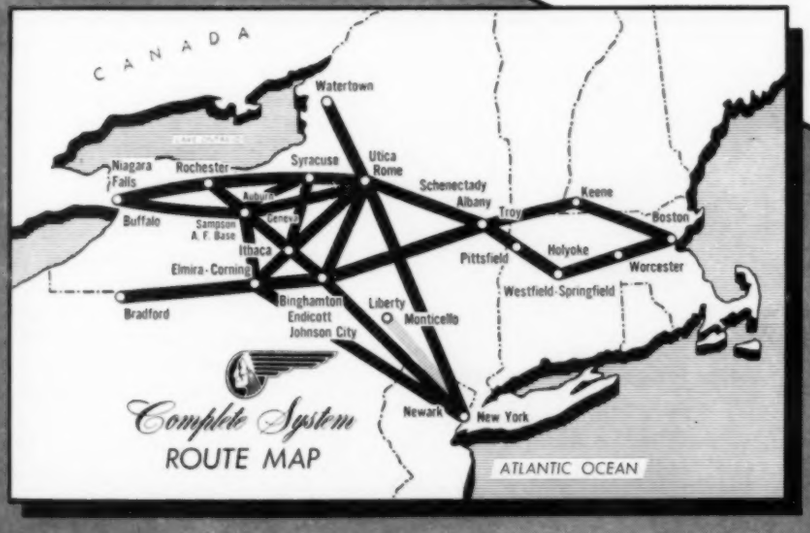


MOHAWK Airlines

keeps pace with the bustling area it serves! From the Great Lakes to the Sea, MOHAWK links 26 growing industrial, commercial, and recreational centers through 16 modern airports — connects them with each other and the world! MOHAWK'S fleet of 10 redesigned DC-3's has been completely redecorated with an eye for beauty and comfort . . . timed for speed and convenience. When you're planning a stop in the busy MOHAWK area — check the MOHAWK schedule!

Helicopter Service!

Now fly with pin-point precision on the Route of the Air Chiefs — the first Transport Helicopter Service by a Local Service Airline!



GENERAL OFFICES: ITHACA, NEW YORK

Intensive Selling for Local Service

Roundup shows methods used by local carriers in never-ending campaign for traffic

LOCAL service carriers are scoring impressively with increased sales effort and projects aimed at higher efficiencies and economy measures. In pure "door-to-door" selling, local air service methods have probably been more intensive than for any other form of transportation. Most of this has been centered on small cities and towns, where experience has now shown that the response cannot be judged by volume alone but by a steady improvement — the effect is cumulative and the task is never-ending. What makes it more difficult than may appear is the fact that all local carriers must, of necessity, conduct their sales drives with extremely modest budgets, both in funds and in manpower.

Excursion Fares

Southern Airways has provided an interesting review of its improvement results for 1953. It covers all bases — sales, maintenance, office conditions, personnel, signboards and even folders. Norman K. Arnold, Southern's vice president for research, reports for the carrier as follows:

"During 1953, Southern Airways showed a 6 per cent increase in passenger revenues and a 7 per cent increase in total non-mail revenues. CAA extended our major overhaul periods, routine inspections being extended from 75-150-225 hrs. to 100-200-300 hrs., airframe overhaul being extended from 8,000 to 9,000 hrs., instrument overhaul being extended from 7,000 to 8,000 hrs. We reduced our personnel from 475 to 408 by virtue of increased efficiency. Our print shop took over our schedule folders and saved $6,000 the first year with better folders. We are experimenting with two-day round-trip excursion fares on certain low-traffic segments with satisfactory results. We are also trying a new type of four-by-four highway signs leading from smaller cities into main terminal points. These signs read, 'Next Time Fly Southern', and are designed to appeal to the people who drive to the main terminal points for their trunk airline reservations."

Operation Back-Scratch

Local service cities capable of generating more traffic than they have in the past, and which are marginal in their local air service volume, have found a lot of value in a promotion which was proved last year at Muskogee, Oklahoma. That city cooperated with Central Airlines in an all-out, month-long campaign for passengers, air mail, express and cargo. Success exceeded original expectations.

Keith Kahle, president of Central, called the promotion "Operation Back-Scratch" and explained its workings as follows:

Central moved its sales manager into Muskogee for the entire month. City officials, the chamber of commerce, post office and business officials cooperated in every possible way. The theme of the promotion was "Progress is in the air" — the driving force behind it was realization that Muskogee knew it would have to generate more traffic in the future if air service was to become a permanent local asset and if new service in new directions was to become possible.

A large "thermometer" was erected in front of the city hall with a column on which was posted the cumulative total of passengers on a day to day basis, the goal at the top of the column being 300 passengers for the month. Each day the column climbed higher and as progress was scored, the promotion became more intense. Twice a week, newspapers published a picture of the score board. Jail officials helped by having prisoners paint sidewalk signs saying, "Progress is in the air,"

in yellow paint on the concrete. Policemen distributed posters proclaiming air progress in every business establishment. Movie houses and radio stations flashed messages. Fillers in the newspapers kept the drive before the public. Window displays and luncheon addresses were among 72 different types of promotional activities which stimulated the drive.

At the end of the drive, the quota of 300 passengers for the month was exceeded. But more important, Muskogee citizens had become active users of local air service as well as enthusiastic backers and supporters of local service. The promotional idea then spread to other cities. The effect of this and other traffic drives has been to balloon Central Airlines passenger traffic from 2,752 passengers in January, a low month, to 5,391 passengers three months later. The volume for May exceeded 5,500 passengers — the highest it has ever been for Central Airlines.

Several local carriers inaugurated stewardess service during the year. Among these were Central, and Sales Promotion Director Ernie Beyl reports an interesting development by Central in the process.

"We installed an in-flight reservation service with stewardesses selling passengers future reservations on Central or other scheduled airlines," Beyl said. "Between December 16 and May 25, 1954, our stewardesses made a total of 594 Central Airline reservations and a total of 414 off-line reservations, for a grand total of 1,008 sales."

One-a-Day Plan

The Civil Aeronautics Board has made it plain that local carriers are faced with succeeding in an all-out, unrelenting selling job — or else. Board Member Joe Adams, for example, made a speech in which he asked the local carriers to board one additional passenger per day per flight per station. The local carriers began intensifying sales efforts along this line, and an example of what was accomplished is reported by Southwest Airways. John H. Connelly, Southwest president, said his "One-a-day sales plan" was initiated on February 1, 1954. The drive produced a 51.5% load factor for February, a 54.2% load factor for March and a whopping 62.5% load factor for April. He said the gain in load factors was directly attributed to Southwest's special one-a-day sales drive.

Increasing load factors are being reported by many of the carriers. Pioneer Air Lines, for example, reports a load factor of 45.9% in January, 49.4% in February, 48.2% in March and 51.6% in April. Harding Lawrence, vice president of Pioneer, expects the carrier will celebrate its 1,000,000th passenger in August, when its 9th anniversary of operations will be observed. Goals of a 60-page sales program are a 50% load factor for the year, 20 per cent more mail, 25 per cent more air freight, 10 per cent more air express and 450,000 ton-miles of first-class mail. Pioneer has profited from an employes' suggestion contest for many months, offering valuable awards each month and annually for the best suggestions which can be used in improving efficiency and lowering costs. Thousands of dollars annually are saved by the suggestions which have been accepted.

Commuter Fare Cut

The national publication, "Newsweek," recently ran an article citing the effective sales promotion done by Piedmont Airlines. Piedmont, trying to pick up extra passengers during the slack flying season, decided to entice time-pressed businessmen with fast-low-cost service. On round trips between selected points, the airline offered travelers an 80-per cent reduction on the return half of their journeys, provided they completed the circuit within 48 hrs. The time advantages were obvious — the air run from Richmond to Norfolk, for instance, takes 64 mins., compared with 5 to 7 hrs. by bus or train. "Automobiles are our real competition," says one official. Roads in the area are generally good, flat and straight and businessmen do a lot of long-distance driving. Since business firms usually permit an 8-cent-a-mile car allowance and Piedmont's commuter rate is only about 3.5 cents, the airline is saying: "Why not send them by air?"

Piedmont's vice president, R. D. Hager, reports that the carrier's passengers increased in 1953 by 20 per cent, the airline carried more revenue passengers than any local carrier, it generated more non-mail revenue than any local carrier and had the lowest cost-per-mile of any local carrier.

$1.50 Minimum Package Rate

Bonanza Airlines reports it has been showing a steady reduction in costs despite the industry's upward trend. Vice President R. H. Herrnstein, in charge of traffic and sales, reports Bonanza is initiating a new package tariff in June, providing for a $1.50 charge for any package up to 10 lbs., with certain exceptions. This is expected to generate substantial interest in Bonanza generally, plus substantial traffic at a very high rate per ton-mile, in repair parts, phonographs, dentures, drugs and other small items where the conventional minimum cost of $3 from nearby wholesale centers is prohibitive. Bonanza has been using, since November, 1952, remotely-controlled field lights at Kingman, Arizona. The approaching pilot turns on the airport lights by pressing the microphone switch a certain number of times. Now the Radio Technical Commission for Aeronautics is investigating the feasibility of such control for field lights at airports which are unattended at night.

Costs Held Despite Expansion

Trans-Texas Airways began operating new routes which effected tremendous expansion but has managed to

Train Replaced by Airline Plane Service

On April 30, 1954, the last train left Brady, Texas, ending railroad service which began 50 years earlier in 1904.

Two days later, scheduled airline service was inaugurated at Brady when a Trans-Texas Airways DC-3 landed and put the city on the air map of the world.

As the train gave way to the airplane, it was noted that the last "iron horse" was Santa Fe Doodlebug No. 82 and the first airliner was Trans-Texas Airways Flight 82. Both chapters of transportation history carried the same number. ★ ★ ★

Southwest Airways Reports 57% Load Factor for Martins

Operation of Martinliner schedules over its busiest routes has proved impressive for Southwest Airways with load factors for the Martin 202 exceeding original expectations.

John H. Connelly, president of Southwest, said that for the first seven months of Martinliner operation ending Dec. 31, 1953, an average load factor of 57% was achieved with a passenger density of 20.5. This 20.5-passenger average load was 9 passengers in excess of Southwest's DC-3 density of 11.7 for the same period. ★ ★ ★

1,000,000th Passenger

Miss Ruth Ann Gee, of Richmond, Va., with Piedmont Pilot.

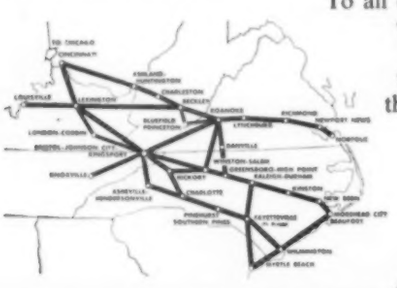
PIEDMONT'S *Picture of Progress*

Recently Piedmont Airlines flew its 1,000,000th passenger—a pretty Hollins College student—and thus became the first local service carrier in the nation to reach this important milestone. It was a big event for Piedmont, which flew its first passenger, an oil executive, back in February of 1948.

In the six years since operations began, Piedmont planes have flown more than 23,995,245 air miles. Piedmont's total number of passengers in 1953 was 270,524, an increase of 20 percent over the previous year.

A large proportion of Piedmont's passengers again traveled "interline" and Piedmont greatly appreciates the contribution of our friends in the industry to our progress in the past six years.

To all of them, we say "thanks." Piedmont Airlines will continue to stimulate and develop interline business and we know we can count on continued fine cooperation from all segments of the airline industry.



Route of the Pacemakers

PIEDMONT AIRLINES

PIEDMONT Airlines

Home office and operations base—Smith Reynolds Airport

WINSTON-SALEM, NORTH CAROLINA

hold down costs through close control over personnel levels and through attention to a multitude of small cost-saving items rather than any one big factor. One development which has helped recently to reduce both flying and station expenses has been a CAB over-flying authority on certain trips to cut circuitous routing and station personnel levels still further. TTA has conducted "Air Progress Month" observances in various small cities through its station managers. Direct mail and personal solicitation have been effective in selling delegates to conventions. In the fall, timetables featured football schedules. A different city is featured in each month's public schedules and the airline newspaper to increase local civil support, and interline promotion with the trunks has been heavy, with over a hundred showings of the American Airlines movie, "Wings Over Dexter." Over-all schedules were altered to provide maximum number of interline connections as a result of a survey of passengers to determine their primary scheduling needs. L. J. Eichner, vice president for traffic and sales, reports the majority of passengers prefer flights originating in the afternoon and terminating in the late afternoon or evening.

"Passenger boardings so far in 1954 have been running almost 50 per cent ahead of early 1953," Eichner reports. "Due to increased length of hauls, passenger miles are up more than 50 per cent. Mail ton-miles are 50 per cent higher. We have been showing 20-per cent increases in air express in the face of an industry-wide decrease of about 20 per cent. We have joined Air Cargo, Inc., and carried 29 per cent more air freight through April than in 1953."

41 Daily Milwaukee-Chicago Flights

Good gains have been accomplished in recent months by North Central Airlines (formerly Wisconsin Central), with first-quarter traffic for 1954 running 43 per cent over that for the same 1953 period. Frank N. Buttomer, vice president for traffic and sales, reports 48,781 revenue passengers for the first three months. North Central has increased service over its six routes and is operating 68 daily flights. These include 41 daily flights Sunday through Friday and 25 on Saturdays between Milwaukee and Chicago. No other local carrier operates as frequently between two cities and only two trunks operate more frequently.

One of the most complete sales programs operated by any local service carrier is that of Frontier Airlines.

Fast, frequent and convenient service is one mighty good reason why Ozark Air Lines carried nearly three times as many revenue passengers in 1953 as in 1951.

The on-time performance, practical timing of schedules, and the marked efficiency and courtesy of Ozark's personnel also have done much to build appreciation and use of Ozark Air Lines services.

Trunk airlines feel the impetus of the growing number of Ozark Air Lines passengers who are scheduled through to more distant points over these connecting lines. And the trunks know they can count fully on Ozark service and cooperation whenever connections to Ozark's on-line cities are required.

OZARK AIR LINES

General Office: Lambert Field, St. Louis, Mo.

THE BUSINESS MAN'S AIRLINE

It takes 48 pages in a Frontier handbook to explain the carrier's promotional activities. C. A. Myhre, president, explains the need for continuous selling by citing figures showing how thin his territory is — total population per route mile on the Frontier system is only 375 persons, as compared with an average of 2,525 persons for all DC-3 operators and 9,892 persons for the maximum density for them. Nevertheless, Frontier in 1953 boarded 130,004 passengers, or 101.5 passengers per 1,000 population. This was second only to West Coast Airlines, which boarded 106.1 per 1,000 population.

Vacation and Tourist Sales

Frontier has six district traffic and sales managers, each managing one metropolitan city and five adjacent intermediate stops. Their sales activities include participation in many local events and showing of movies from major airlines, averaging 400 film showings annually to audiences numbering from 20 to 600. Over 240 airport tours were conducted last year. Barnstorming has become a major Frontier promotion, in which revenue matches expenses with the resultant advertising values coming as a free bonus. An example of vacation and tourist selling: Frontier sold 100 trips to the Grand Canyon in 1950, 500 in 1952 and 1,000 in 1953, all of them including a fare on Frontier and many of them interline fares. There are 10 universities and 6 junior colleges on Frontier routes and Frontier has a project in which students conduct surveys to determine travel habits. Besides coming up with interesting information, such surveys have great value in that whole classes of students talk Frontier and air travel while canvassing cities at no cost to Frontier. Community "air week" observances are sponsored by Frontier at every opportunity. ★ ★ ★

MAIL EXPERIMENT

(Continued from page 31)

in Southern California takes about 12 hours and 20 minutes to get to San Francisco, and Southwest Airways carried it in 3 hours and 20 minutes.

In some areas significant reductions in distance traveled helped reduce the Post Office Department's cost. For instance, mail from Northern Michigan was flown across Lake Michigan to Detroit instead of going by surface through Chicago. As a result, Northern Michigan received 5¼-hour mail service to Detroit.

Public response was uniformly enthusiastic. Editorial comment in numerous papers throughout the country welcomed the experiment and hoped it would soon be permanent. The following editorial comment of "The Binghamton (N. Y.) Sun" of January 18, 1954, was typical:

Heavy mail loads were handled by all 14 local service airlines in the first-class-mail-by-air experiment last Christmas. Photo shows a Pioneer Air Lines crew handling some of the load. In 8 days, nearly 500,000 lbs. of mail was moved to break the usual holiday postal jam. The experiment was so successful and economical that it may be the forerunner of full-scale air movement of surface mail to many small cities served by local carriers.

"Air service would bridge short-haul gaps where lack of surface transportation, circuity of routing, and the slow rate of speed due to the limitations of surface vehicles produce poor service.

"On the long-haul side, air transportation provides all of the answers. Letters and packages mailed here today could be delivered tomorrow in practically every large city, and many small ones, in the nation.

"There is space available in the air transports of today for our first-class mail.

"We hope that the experiments herald a new era in better mail service for all of us in 1954."

By December 25 the bulk of the Christmas mail had been moved; there were no backlogs and the experiment was over. But the long-range program for the movement of "surface mail" by air was far from over. In January the local airlines asked the Civil Aeronautics Board to continue their authority to carry surface mail for one year, and on February 5 the Board granted approval.

Meanwhile, extensive study and discussion between the local airlines and the Post Office had taken place so that the Post Office was ready to start flying the surface mail on a more permanent and widespread basis.

Locals May Continue, Broaden Experiment

On March 10 the Post Office Department authorized three local airlines to carry surface mail over certain segments on their routes. They are Central, Frontier and North Central. During the first twenty-two days, these three carried 65,546 pounds of mail, which represented 10,135 ton-miles.

These three airlines carry mail at the rate of 30 cents per ton-mile on a space-available basis, to serve the following points:

Central: Amarillo, Texas; Borger, Texas; Woodward, Oklahoma; Enid, Oklahoma; Oklahoma City, Oklahoma; Ponca City, Oklahoma; Bartlesville, Oklahoma; Tulsa, Oklahoma; and Dallas/Fort Worth, Texas. Service between Ponca City and Fort Worth is in one direction only, south from Ponca City.

Frontier: Denver, Colorado; Pueblo, Colorado; Alamosa, Colorado; Durango, Colorado; Farmington and Gallup, New Mexico; Winslow, Flagstaff, Prescott, and Phoenix, Arizona.

North Central: Direct service Duluth, Virginia, Minnesota; Superior, Wisconsin; to and from Minneapolis-St. Paul. In the Duluth area, 74 post offices will benefit from this movement, most of this mail clearing through Duluth.

Also, *North Central:* Houghton, Hancock, Calumet, Marquette, Ishpeming, Negaunee, Iron Mountain, and Escanaba, Michigan; Marinette, Wisconsin; Menominee, Michigan; Green Bay, Wisconsin; Grand Rapids, Lansing and Detroit, Michigan.

Frontier is carrying first-class mail on one flight each way between Phoenix and Denver. During the twenty-two-day period in March these two flights carried almost 5,000 ton-miles of mail. Mail is delivered to post offices along the route in two to seven hours which previously took from one to three days.

At present, the Post Office Department is studying proposals to transport surface mail flying over portions of the other eleven local airlines.

The challenge to the local service industry in the first-class-mail-by-air program is very great and the rewards are commensurate. The carriage of surface mail enables the carriers to utilize unused space, earn additional revenues which will reduce the amount of subsidy required from the government, and perform a valuable public service. ★ ★ ★

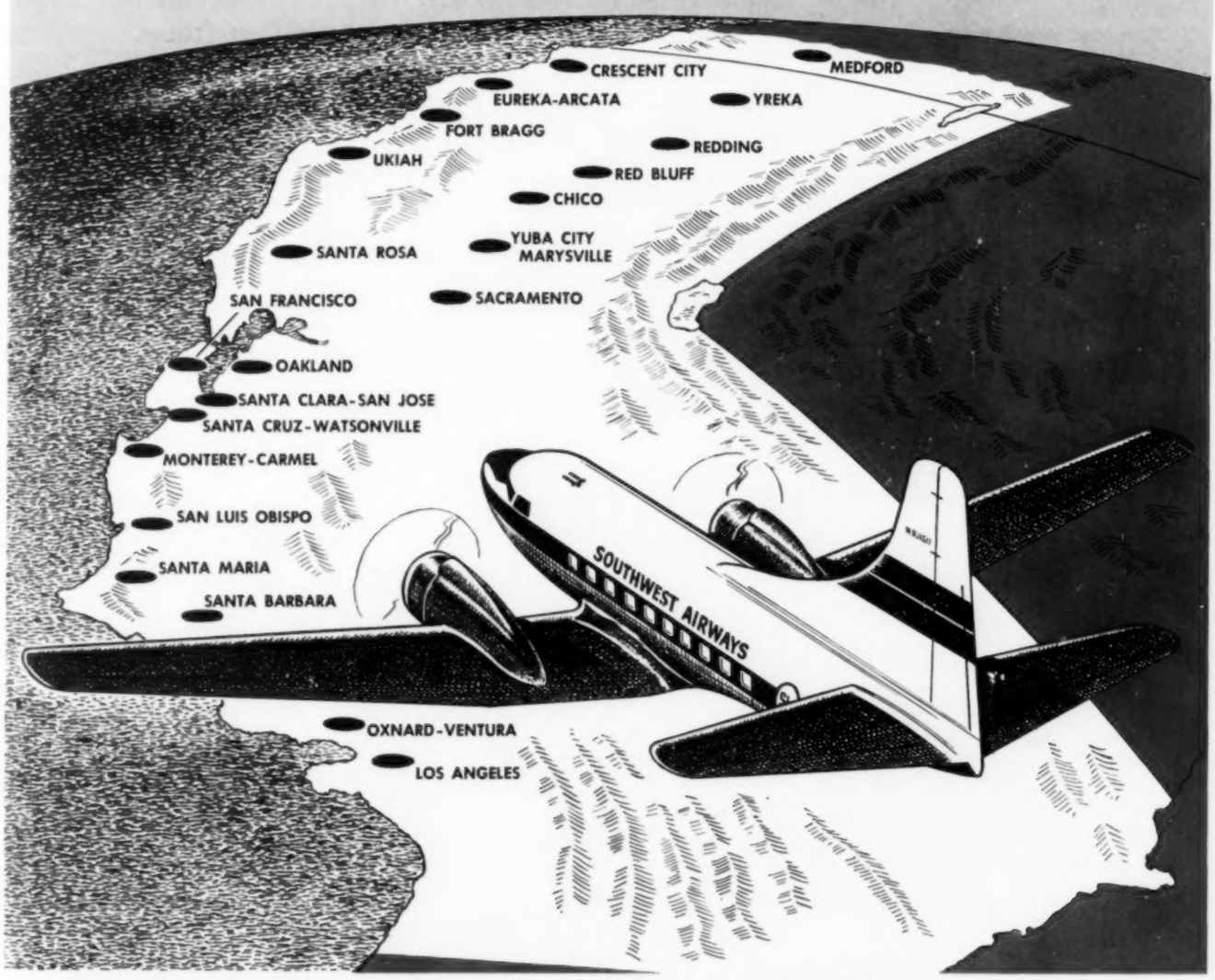
SOUTHWEST AIRWAYS

Serves more California cities than any other scheduled airline

EXCELLENT CONNECTIONS WITH ALL AIRLINES

serving Los Angeles, San Francisco and Medford, Oregon

Southwest "Joint Fares" between many Eastern points and California cities provide substantial savings to passengers from all cities served. Full details supplied on request.



Above all • fly

SOUTHWEST AIRWAYS

GENERAL OFFICES — SAN FRANCISCO AIRPORT
SOUTH SAN FRANCISCO, CALIFORNIA

DESTINY AND DEFINITION

(Continued from page 27)

trunk line and local service passengers between major terminal points *only* to the extent that we handle overflow from the trunks. Our growth should not, under any circumstances, be dependent upon attracting or penetrating this type traffic.

The Local Carriers' Place

The restriction against non-stop operations between major terminals obviously confines the local carriers to a specific activity sphere. This, in turn, tends to control the size and structure of the local carrier. The question of how large a local carrier should be and how it should look, is difficult to treat in a limited space; yet, from the standpoint of its importance to long-range planning and perspective, it possibly outranks all other facets of the problem.

So long as we do not attempt to compete with the trunks between major terminals, the size of the area to be served by the local carrier is of little importance. Obviously, it is desirable to spread indirect costs over the largest possible base. This, however, is not the controlling factor. In fact, there are some pretty bad booby traps involved where size is the primary goal.

The United States is rather clearly divided into a number of large areas of closely integrated interests, with each area embracing several large trading and industrial centers. The community of interest between the smaller intermediate cities within an area lies predominantly with one or more of the large centers within the same area. There is a relatively limited community of interest between the intermediate cities of one area with the trading centers or cities in another area.

The trunk-line function is to link together the major trading and industrial centers within an area, and to link this area with the other areas. The local service function is to link the intermediate communities to the trade and industrial centers *within its area.*

The particular trade area, therefore, determines the size and the route structure of the local carrier. For maximum results the local carriers must be confined to these areas. By the same token, the local carriers' routes should be "anchored" to the large cities along the perimeter of the area being served. To accomplish this, some routes will have to be extended, while others should either be abandoned or transferred. For maximum development, there should be at least two routes into each of the "anchor" cities.

LOCAL SERVICE AIRLINES
Comparison of Revenue Hours Flown
1952-1953

Carrier	1952	1953	% Decrease
Allegheny	24,209	24,912	2.90
Bonanza	8,452	11,268	33.32
Central	12,643	12,918	2.18
Frontier	32,092	29,866	(6.94)
Lake Central	7,951	12,044	51.48
Mohawk	14,535	18,849	29.68
North Central	18,635	30,535	63.86
Ozark	19,047	21,745	14.16
Piedmont	33,743	39,739	17.77
Pioneer	22,892	18,333	(19.92)
Southern	22,360	19,853	(11.21)
Southwest	21,209	20,719	(2.31)
Trans-Texas	18,765	23,785	26.75
West Coast	20,882*	26,245	25.68
Total	277,415	310,811	12.04

*Includes Empire.

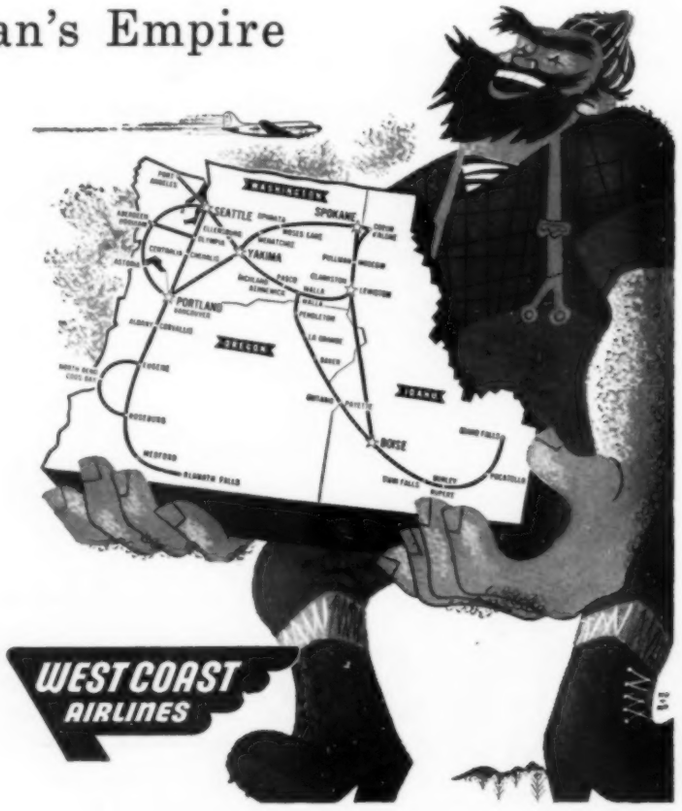
Making the Local Carriers Stronger

ESTABLISH THE BOUNDARIES AND ANCHOR CITIES OF INDIVIDUAL LOCAL SERVICE "AREAS" — Long-range planning is difficult, and certainly filled with inaccuracies, until the boundaries of the trading areas are established. Everything else stems from this initial step.

The next phase of development for the local carriers is the establishment of these areas. Accomplishment will entail some major alterations in the local service structure as we know it today — mergers, route transfers, con-

Serving Paul Bunyan's Empire

Fast, frequent flights to 44 cities in Washington Oregon and Idaho



One of the SCHEDULED AIRLINES of the U. S. A.

WEST COAST AIRLINES

LOCAL SERVICE AIRLINES
Comparison of Total Revenue Ton-Miles Flown
1952-1953

Carrier	1952	1953	% Increase
Allegheny	2,782,460	3,214,999	15.55
Bonanza	1,081,017	1,564,606	44.73
Central	706,215	683,772	(3.18)
Frontier	3,958,896	3,748,222	(5.32)
Lake Central	575,721	876,573	52.26
Mohawk	1,875,060	2,633,145	40.43
North Central	2,627,051	3,906,138	48.69
Ozark	1,434,151	2,055,447	43.32
Piedmont	5,157,648	5,869,922	13.81
Pioneer	5,128,361	4,254,920	(17.03)
Southern	2,169,819	2,014,000	(7.18)
Southwest	3,304,513	3,810,827	15.32
Trans-Texas	1,968,001	2,238,801	13.76
West Coast	2,316,103*	2,754,364	18.92
Totals	35,085,016	39,625,736	12.94

*Includes Empire.

solidation of services, etc.

This will be a painful process. It should be accomplished within the next three years — more probably will take at least five. Yet, it must be done, arbitrarily if necessary, if a strong and permanent local service pattern is to be developed.

RELAX SCHEDULE RESTRICTIONS — The local carriers were created in an atmosphere clearly designed to avoid competition of any description to the trunks. As a result, the locals were originally required to make every stop on every flight; the routes were highly circuitous; unproductive stops were required in some cases by the locals simply to reduce or eliminate any semblance of competition.

The economics of this gradually became apparent, and gradually the routes have been straightened out, some unproductive stops eliminated and some over-flying permitted. With this greater flexibility the locals have grown and done so without harm to the trunks. In fact, the converse is true, if the approximately $20,000,000 turned over to the trunks by the local carriers last year is any measurement.

The trend has not gone far enough. I am a firm believer in the policy that the trunks should be protected against serious diversion between their major points. By the same token, I do not believe protection is necessary or called for between an intermediate community receiving only "token" service from the trunk and a major point; nor do I believe that there should be any scheduling restrictions between points where the local airline is the sole operator over the route.

The adoption of three basic scheduling policies would do much to strengthen the local carriers —

(1) *Reduce scheduling restrictions between major terminal points* to the minimum necessary to avoid serious diversion from the trunks operating between the areas. A requirement for two intermediate stops normally should serve this purpose. In isolated cases, depending upon the circumstances, one stop would be sufficient; in a few cases three might be required but never more than three. The reason for this is not to get into the terminal-to-terminal business of the trunks; rather it is to provide a better, more salable service at intermediate points at less cost.

In an area where demand at the intermediate cities has developed to the point where limited-stop direct

LOCAL SERVICE AIRLINES
Comparison of Total Operating Expenses
(Cents Per Revenue Mile)

Carrier	1952	1953	% Decrease
Allegheny	120.19	120.07	0.10
Bonanza	112.98	108.21	4.41
Central	125.45	120.73	3.91
Frontier	100.95	107.46	(6.06)
Lake Central	121.33	125.04	(2.97)
Mohawk	106.66	112.32	(5.04)
North Central	115.34	114.94	0.35
Ozark	107.59	114.63	(6.14)
Piedmont	86.10	92.96	(7.38)
Pioneer	121.84	137.10	(11.08)
Southern	97.51	105.57	(7.63)
Southwest	100.88	118.57	(14.92)
Trans-Texas	97.03	101.84	(4.72)
West Coast	92.33	98.58	(6.34)
Average	102.56	110.72	(7.37)

LOCAL SERVICE AIRLINES
Comparison of Total Non-Mail Revenue
(Cents Per Revenue Mile)
1952-1953

Carrier	1952	1953	% Increase
Allegheny	56.15	64.63	15.11
Bonanza	52.86	57.14	8.10
Central	18.43	20.90	13.40
Frontier	41.65	45.84	10.06
Lake Central	31.49	33.15	5.27
Mohawk	64.72	77.05	19.05
North Central	53.76	56.37	4.85
Ozark	31.50	40.55	28.73
Piedmont	64.22	63.18	(1.60)
Pioneer	78.07	79.53	1.87
Southern	37.25	39.88	7.06
Southwest	68.15	76.59	12.38
Trans-Texas	39.29	36.38	(7.41)
West Coast	51.88	47.49	(8.46)
Average	50.55	54.23	7.28

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TRANS-TEXAS AIRWAYS

GENERAL OFFICES • MUNICIPAL AIRPORT • HOUSTON 17, TEXAS

Statistical Analysis of Local

	Allegheny	Bonanza	Central	Frontier	Lake Central	Mohawk
OPERATING REVENUES (Dollars):						
Passenger	2,046,536	886,419	346,445	1,782,764	485,068	1,871,171
U. S. Mail	1,883,024	867,141	1,873,667	2,901,764	1,537,878	774,701
Other	150,190	62,606	40,526	234,922	58,281	105,931
Total Revenue	4,079,750	1,816,166	2,260,638	4,919,450	2,081,227	2,751,803
OPERATING EXPENSES (Dollars):						
Flying Operations	1,211,213	518,312	614,288	1,491,915	582,200	894,044
Maintenance Flight Equipment	448,324	196,484	237,925	522,013	271,357	391,094
Depreciation Flight Equipment	212,081	64,809	161,793	90,147	65,795	152,898
Total Direct Expense	1,871,618	779,605	1,014,006	2,104,075	919,352	1,438,036
Ground Operations	679,099	281,604	419,569	932,293	451,668	439,411
Maint.—Ground and Indirect	308,004	154,983	180,802	346,565	124,051	236,223
Passenger Service	163,686	78,520	83,761	228,265	74,145	134,742
Traffic and Sales	575,928	212,580	221,555	475,510	253,389	261,478
Advertising, Publicity	121,836	60,081	45,584	161,333	49,440	50,165
Gen. and Administrative	311,895	186,262	240,763	436,363	173,692	280,203
Depreciation—Ground	49,015	43,677	29,258	45,902	4,029	42,002
Total Indirect Expense	2,209,463	1,017,707	1,221,292	3,626,231	1,130,414	1,444,224
Total Operating Expense	4,081,081	1,797,312	2,235,298	4,730,306	2,049,766	2,882,260
Break-Even Need	1,884,355	848,287	1,851,327	2,712,620	1,504,417	905,158
CENTS PER REVENUE MILE FLOWN:						
Operating Revenues:						
Passenger	60.21	53.37	18.71	40.50	29.59	72.92
U. S. Mail	55.40	52.21	101.19	65.92	93.81	30.19
Other	4.42	3.77	2.19	5.34	3.56	4.13
Total Revenue	120.03	109.35	122.09	111.76	126.96	107.24
Operating Expenses:						
Flying Operations	35.64	31.21	33.18	33.89	35.52	34.84
Maintenance Flight Equipment	13.19	11.83	12.85	11.86	16.55	15.24
Depreciation Flight Equipment	6.24	3.90	8.74	2.05	4.01	5.96
Total Direct Expense	55.07	46.94	54.77	47.80	56.08	56.04
Ground Operations	19.98	16.95	22.66	21.18	27.55	17.12
Maint.—Ground and Indirect	9.06	9.33	9.77	7.87	7.57	9.21
Passenger Service	4.82	4.73	4.52	5.19	4.52	5.25
Traffic and Sales	16.94	12.80	11.97	10.80	15.46	10.19
Advertising, Publicity	3.58	3.62	2.46	3.67	3.02	1.95
Gen. and Administrative	9.18	11.21	13.00	9.91	10.60	10.92
Depreciation—Ground	1.44	2.63	1.58	1.04	0.24	1.64
Total Indirect Expense	65.00	61.27	65.96	59.66	68.96	56.28
Total Operating Expense	120.07	108.21	120.73	107.46	125.04	112.32
Break-Even Need	55.44	51.07	99.83	61.62	91.89	35.27
CENTS PER REVENUE TON-MILE:						
Non-Mail Revenue	68.33	60.66	56.59	53.83	61.99	75.09
Mail Revenue	58.57	55.42	274.02	77.42	175.44	29.42
Total Revenue	126.90	116.08	330.61	131.25	237.43	104.51
Direct Flight Expense	58.22	49.83	148.30	56.13	104.88	54.61
Indirect Expense	68.72	65.04	178.61	70.07	128.96	54.85
Total Expense	126.94	114.87	326.91	126.20	233.84	109.46
PASSENGERS CARRIED						
Per Employe	440	325	140	234	196	498
Per Airplane	16,436	13,512	8,499	10,834	8,156	16,327
TON-MILES CARRIED:						
Per Employe	6,615	7,522	2,249	6,741	3,012	8,028
Per Airplane	247,308	312,921	136,754	312,352	125,225	263,314
Average Passenger Trip Length—Miles	148	230	151	254	149	168
Average Passenger Fare Paid (Dollars)	9.58	13.12	8.15	13.71	8.50	11.46
Average Revenue Per Passenger Mile—Cents	6.47	5.69	5.41	5.39	5.69	6.84
Passengers Per 1,000 Population Served	14	26	25	101	7	14
ROUTE PATTERN DATA OPERATED AS OF DECEMBER 31, 1953						
Unduplicated Route Miles	2,216	1,315	1,408	3,417	1,305	1,149
Number of Stations	30	15	21	34	21	15
Number of Exclusive Local Service Stations	12	10	10	23	10	3
Daily Route Mile Turnover	4.29	3.60	3.60	3.38	3.97	6.76
Months in Operation to December 31, 1953	57	48	51	85	50	63
Number of Employes	486	208	304	556	291	328
Landings Per Day	161	49	87	133	102	105
SELECTED OPERATING STATISTICS:						
Revenue Miles Flown	3,398,826	1,660,977	1,851,565	4,401,723	1,639,279	2,565,999
Revenue Hours Flown	24,912	11,268	12,918	29,866	12,044	18,849
Schedule Completion Factor	96.26	98.45	98.00	98.64	95.86	95.88
Number of Aircraft Scheduled	13	5	5	12	7	10
Revenue Passenger Miles (000)	31,611	15,572	6,397	33,058	8,528	27,366
Revenue Passenger Load Factor	44.29	44.64	16.45	35.76	24.77	50.78
Average Passenger Load	9.30	9.38	3.45	7.51	5.20	10.66
REVENUE TON-MILES FLOWN:						
Passenger	3,003,034	1,479,244	597,278	3,140,319	767,989	2,453,160
U. S. Mail	70,456	23,164	40,479	101,232	23,558	33,759
Express	129,256	19,544	13,077	66,345	79,429	68,210
Freight	—	32,252	29,933	424,682	664	71,149
Excess Baggage	12,253	10,402	3,005	15,644	4,923	6,867
Total	3,214,999	1,564,606	683,772	3,748,222	876,573	2,633,145
Revenue Ton-Mile Load Factor	39.41	39.25	15.39	35.48	22.28	42.76
Revenue Passengers Carried	213,666	67,560	42,496	130,004	57,093	163,270
Tons Revenue Express and Freight	978	280	263	1,560	577	914
Daily Aircraft Utilization	5:31	6:22	6:06	6:48	5:25	5:31
Average Flying Speed	136.4	147.4	143.3	147.4	136.1	136.1
Revenue Ton-Miles Per Revenue Mile	0.95	0.94	0.37	0.85	0.53	1.03

Service Airline Operations for 1953

North Central	Ozark	Piedmont	Pioneer	Southern	Southwest	Trans-Texas	West Coast	Total or Average
2,303,738	1,149,687	3,548,073	2,362,982	1,124,336	1,926,293	1,205,176	1,613,080	22,651,768
2,468,685	2,109,551	1,643,367	1,180,765	2,036,354	1,065,121	2,195,231	1,644,808	24,182,057
114,878	68,319	196,609	155,989	81,145	252,824	83,280	61,263	1,666,763
4,887,301	3,327,557	5,388,049	3,699,736	3,241,835	3,244,238	3,483,687	3,319,151	48,500,588
1,378,220	986,632	1,906,537	1,343,119	1,001,183	1,068,165	1,157,667	1,234,872	15,388,367
690,589	443,989	761,993	780,528	436,518	372,795	429,729	353,882	6,337,220
371,383	364,263	239,458	287,934	91,390	154,190	67,698	97,538	2,421,377
2,440,192	1,794,884	2,907,988	2,411,581	1,529,091	1,595,150	1,655,094	1,686,292	24,146,964
854,545	462,060	645,039	642,586	501,963	587,666	566,501	665,638	8,129,642
362,024	273,322	306,238	212,497	240,392	268,653	332,156	173,788	3,519,698
207,489	136,240	278,356	179,168	134,786	154,313	145,391	147,380	2,146,242
557,885	362,360	843,799	471,213	458,485	375,541	496,305	361,325	5,927,353
116,452	48,245	167,034	87,132	66,577	104,008	113,713	117,769	1,309,369
335,891	325,479	331,457	293,289	225,692	240,537	264,662	293,357	3,939,542
56,924	40,638	29,769	45,543	33,913	47,727	32,619	29,880	530,896
2,491,210	1,648,344	2,601,692	1,931,428	1,661,808	1,778,445	1,951,347	1,789,137	25,502,742
4,931,402	3,443,228	5,509,680	4,343,009	3,190,899	3,373,595	3,606,441	3,475,429	49,649,706
2,512,786	2,225,222	1,764,998	1,824,038	1,985,418	1,194,478	2,317,985	1,801,086	25,331,175
53.69	38.28	59.86	74.60	37.20	67.70	34.03	45.76	50.51
57.54	70.23	27.73	37.27	67.38	37.44	61.99	46.66	53.93
2.68	2.27	3.32	4.93	2.68	8.89	2.35	1.73	3.72
113.91	110.78	90.91	116.80	107.26	114.03	98.37	94.15	108.16
32.12	32.85	32.17	42.40	33.13	37.54	32.69	35.03	34.32
16.10	14.78	12.85	24.64	14.44	13.10	12.14	10.04	14.13
8.66	12.13	4.04	9.09	3.02	5.42	1.91	2.76	5.40
56.88	59.76	49.06	76.13	50.59	56.05	46.74	47.83	53.85
19.92	15.38	10.88	20.28	16.61	20.65	16.00	18.88	18.13
8.44	9.10	5.17	6.71	7.95	9.44	9.38	4.93	7.85
4.84	4.54	4.70	5.66	4.46	5.42	4:11	4.18	4.79
13.00	12.06	14.24	14.87	15.17	13.20	14.01	10.25	13.22
2.71	1.61	2.82	2.75	2.20	3.66	3.21	3.34	2.92
7.83	10.83	5.59	9.26	7.47	8.46	7.47	8.32	8.79
1.32	1.35	0.50	1.44	1.12	1.68	0.92	0.85	1.18
58.06	54.87	43.90	60.97	54.98	62.51	55.10	50.75	56.87
114.94	114.63	92.96	137.10	105.57	118.57	101.84	98.58	110.72
58.55	74.08	29.78	57.57	65.69	41.98	65.46	51.09	56.49
61.92	59.26	63.79	59.20	59.86	57.18	57.55	60.79	61.37
63.20	102.63	28.00	27.75	101.11	27.95	98.05	59.72	61.03
125.12	161.89	91.79	86.95	160.96	85.13	155.60	120.51	122.40
62.47	87.32	49.54	56.68	75.92	41.86	73.93	61.22	60.94
63.78	80.20	44.32	45.39	82.51	46.67	87.16	64.96	64.36
126.25	167.52	93.86	102.07	158.43	88.53	161.09	126.18	125.30
354	324	409	373	273	583	188	464	342
12,200	11,384	18,035	14,758	11,247	20,930	6,496	13,570	13,146
6,300	5,325	8,880	10,745	4,898	11,798	4,314	7,847	6,784
217,008	186,859	391,328	425,492	201,400	423,425	149,253	229,531	260,696
173	167	212	279	173	199	215	179	194
10.49	9.18	13.12	16.01	10.00	10.23	12.37	9.91	11.34
6.06	5.51	6.20	5.74	5.78	5.13	5.74	5.55	5.86
27	16	100	71	38	51	28	106	42
2,691	2,090	2,480	1,850	2,135	1,136	3,207	2,221	28,469
34	32	26	21	29	23	39	32	372
25	13	7	10	13	18	22	19	195
4.46	4.12	6.70	5.14	3.83	5.72	3.72	3.97	4.43
70	39	70	101	55	84	75	84	66.6
620	386	661	396	412	323	519	351	5,841
167	133	205	112	123	118	172	148	1,713
4,290,409	3,003,772	5,927,180	3,167,678	3,022,365	2,845,172	3,541,292	3,525,397	44,841,634
30,535	21,745	39,739	18,333	19,853	20,719	23,785	26,245	310,811
94.20	96.23	97.70	98.15	97.68	98.35	98.09	97.50	97.19
18	11	15	10	10	9	15	12	152
38,034	20,867	57,218	41,181	19,435	37,541	20,991	29,082	386,881
42.21	33.08	45.97	42.91	30.62	54.99	28.23	39.28	39.49
8.86	6.95	9.65	13.00	6.43	13.19	5.93	8.25	8.63
3,611,356	1,940,562	5,435,742	3,912,212	1,846,181	3,566,332	1,994,269	2,630,783	36,378,461
112,505	43,152	107,689	120,282	80,050	80,855	92,869	45,943	976,003
161,963	61,168	104,408	41,560	73,507	43,130	41,978	23,996	927,571
—	—	179,820	156,875	—	108,011	102,140	44,379	1,149,905
20,314	10,565	42,263	23,991	14,262	12,499	7,545	9,263	193,796
3,906,138	2,055,447	5,869,922	4,254,920	2,014,000	3,810,827	2,238,801	2,754,364	39,625,736
37.93	28.51	41.26	41.50	27.77	50.17	26.34	32.55	35.69
219,596	125,220	270,524	147,584	112,469	188,366	97,434	162,846	1,998,128
890	419	1,230	600	388	868	749	423	10,139
5:44	6:15	7:36	5:46	5:40	5:37	5:28	6:10	6:03
140.5	138.1	149.2	172.8	152.2	137.3	148.9	134.3	144.3
0.91	0.68	0.99	1.34	0.67	1.34	0.63	0.78	0.88

—Compilation by Ray & Ray, Consultants.

service can be supported, the freedom to overfly easily translates into significant economics. For example, between two of Allegheny's cities we are required to make one stop. Due to the circuity of the route, the present fare yields us 6 cents per passenger mile. Operating direct without the stop and charging the same fare, our yield is increased to 7 cents per passenger mile. One cent over our entire system means $35,800 per month to us.

There are two other by-products of this freedom to operate direct flights between intermediate points and terminal points: First, the obvious one of greater operating economy. The circuitous operation in the example costs us nearly thirty dollars more per flight than would a direct flight. The second by-product is the not-to-be-ignored fact that we give the passengers a better ride and more attractive service, thus generating more local business.

(2) *Eliminate all restrictions between any intermediate point and the terminal point,* especially where the restriction is designed to protect a trunk carrier which is operating only a token service of one or two round trips per day through the intermediate station.

Restrictions of this type are particularly harmful to local service development because very often they necessitate stopping flights at other intermediate points already receiving adequate service from the local carrier. The economics and other advantages are the same as those outlined in the previous point.

(3) *There should be no restrictions against operating non-stop service between terminals — regardless of the distance involved* — where the local carrier is the only operator between a major terminal and its own terminating point.

In some cases this may involve a rather substantial distance. But it is emphasized that the only ban necessary on long-haul operation should be between major cities along *regular trunk routes.* The reason for the ban is to avoid diversion from the trunks; the ban is not against distance.

So long as we do not penetrate or directly compete with the trunk line operation between major terminals, then we should be free to provide the best, most direct service between any pair of points served exclusively by the local carriers over regular routes. The only deterrent to direct non-stop operation of this type should be the question of whether the demand and use will support the operation.

SUSPENSIONS — Where a trunk carrier and a local service carrier's route parallel between an intermediate point and a terminal, and further where the trunk as a matter of con-

LOCAL SERVICE AIRLINES
Comparison of Revenue Express and Freight Ton-Miles Flown
1952-1953

Carrier	1952	1953	% Increase
Allegheny	118,638	129,256	8.95
Bonanza	37,694	51,796	37.41
Central	34,187	43,010	25.81
Frontier	493,024	491,027	(0.41)
Lake Central	54,996	80,093	45.63
Mohawk	99,782	139,359	39.66
North Central	138,341	161,963	17.08
Ozark	70,331	61,168	(13.03)
Piedmont	243,340	284,228	16.80
Pioneer	221,242	198,435	(10.31)
Southern	88,403	73,507	(16.85)
Southwest	162,190	151,141	(6.81)
Trans-Texas	112,393	144,118	28.23
West Coast	71,503*	68,375	(4.37)
Total	1,946,064	2,077,476	6.75

*Includes Empire.

LOCAL SERVICE AIRLINES
Comparison of U. S. Mail Ton-Miles Flown
1952-1953

Carrier	1952	1953	% Increase
Allegheny	63,071	70,456	11.71
Bonanza	16,563	23,164	39.85
Central	33,001	40,479	22.66
Frontier	109,740	101,232	(7.75)
Lake Central	15,495	23,568	52.10
Mohawk	34,005	33,759	(0.72)
North Central	94,696	112,505	18.81
Ozark	40,578	43,152	6.34
Piedmont	85,823	107,689	25.48
Pioneer	125,893	120,282	(4.46)
Southern	86,387	80,050	(7.34)
Southwest	84,432	80,855	(4.24)
Trans-Texas	63,684	92,869	45.83
West Coast	35,183*	45,943	30.58
Total	888,551	976,003	9.84

*Includes Empire.

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Birmingham, Ala.

LOCAL SERVICE AIRLINES
Comparison of Revenue Passenger Miles Flown
1952-1953

Carrier	(000) 1952	(000) 1953	Increase %
Allegheny	26,798	31,611	17.96
Bonanza	10,751	15,572	44.84
Central	6,689	6,397	(4.37)
Frontier	34,025	33,058	(2.84)
Lake Central	5,481	8,528	55.59
Mohawk	19,220	27,366	42.38
North Central	25,238	38,034	50.70
Ozark	14,147	20,867	47.50
Piedmont	50,435	57,218	13.45
Pioneer	48,886	41,181	(15.76)
Southern	20,820	19,435	(6.65)
Southwest	31,331	37,541	19.82
Trans-Texas	18,361	20,991	14.32
West Coast	24,296*	29,082	19.70
Total	336,478	386,881	14.98

*Includes Empire.

LOCAL SERVICE AIRLINES
Number of Employes
Year 1953

Carrier	Beginning of Year	End of Year	% Increase
Allegheny	474	486	2.53
Bonanza	186	208	11.82
Central	261	304	16.47
Frontier	545	556	2.02
Lake Central	161	291	80.75
Mohawk	250	328	31.21
North Central	488	620	27.05
Ozark	379	386	1.85
Piedmont	601	661	9.98
Pioneer	449	396	(11.80)
Southern	463	412	(11.01)
Southwest	355	323	(9.01)
Trans-Texas	368	519	41.03
West Coast	359	351	(2.23)
Total	5,339	5,841	9.41

sistent practice has operated only two or less trips per day through the intermediate station, then the trunk carrier should be suspended.

At first glance, this might seem like a "man-bites-dog" sort of thing, or even inconsistent with earlier statements on trunk versus local relationships. It is not. Suspension of the trunks at their thinly-scheduled intermediate stops would, in fact, strengthen both the trunk and the local carrier.

With but rare exceptions a trunk will lose money at a station served by two or less round trips. On the average, the suspended trunk loses only the revenue between the intermediate point and the terminal while at the same time more than making this up on the savings in station and operating costs. If the passenger goes beyond the terminal point, the chances are excellent that the trunk will get the revenue beyond the point any way, and without the expense of generating it.

As an example one trunk has suspended at three common points with Allegheny. We connect with this carrier at the terminal point of this route. During 1953, the total revenue turned over to the trunk carrier amounted to $370,771. This is substantially more than the total on-line revenue produced by all three stations.

A policy of suspension at such intermediate points is not harmful to the trunks, and it is a real help to the local service airlines operating in the area.

On Subsidy

The subsidy question is, of course, the core of everyone's concern with this problem. Whether subsidy is justified for the local services is dependent upon the evaluation of the arguments presented here. If it has been justified, as it has to be before the core is reached, then the question is: How much and for how long?

It has been customary to measure subsidy in terms of the total subsidy dollars required to sustain the service. This is a poor measuring stick and it is deceptive in a most harmful sense. Subsidy — and progress — should be measured in terms of how much is being provided per dollar of subsidy. Whether you use seat miles, passengers, passenger miles or some other service criterion, the record will show that real progress has been made and that the government and taxpayers are getting much more today for $24,000,000 than they were getting in 1950 for $17,000,000.

Mail pay, or subsidy, has gone up, not because of any real or implied inefficiency, but rather because the services performed have been greatly increased. The simplest way to illus-

Now Serving 45 Cities in the Upper Midwest

41 FLIGHTS DAILY
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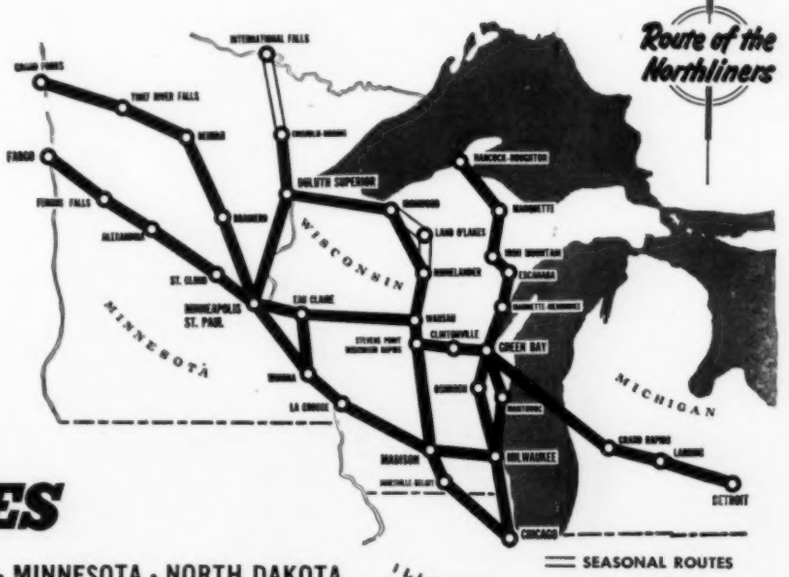
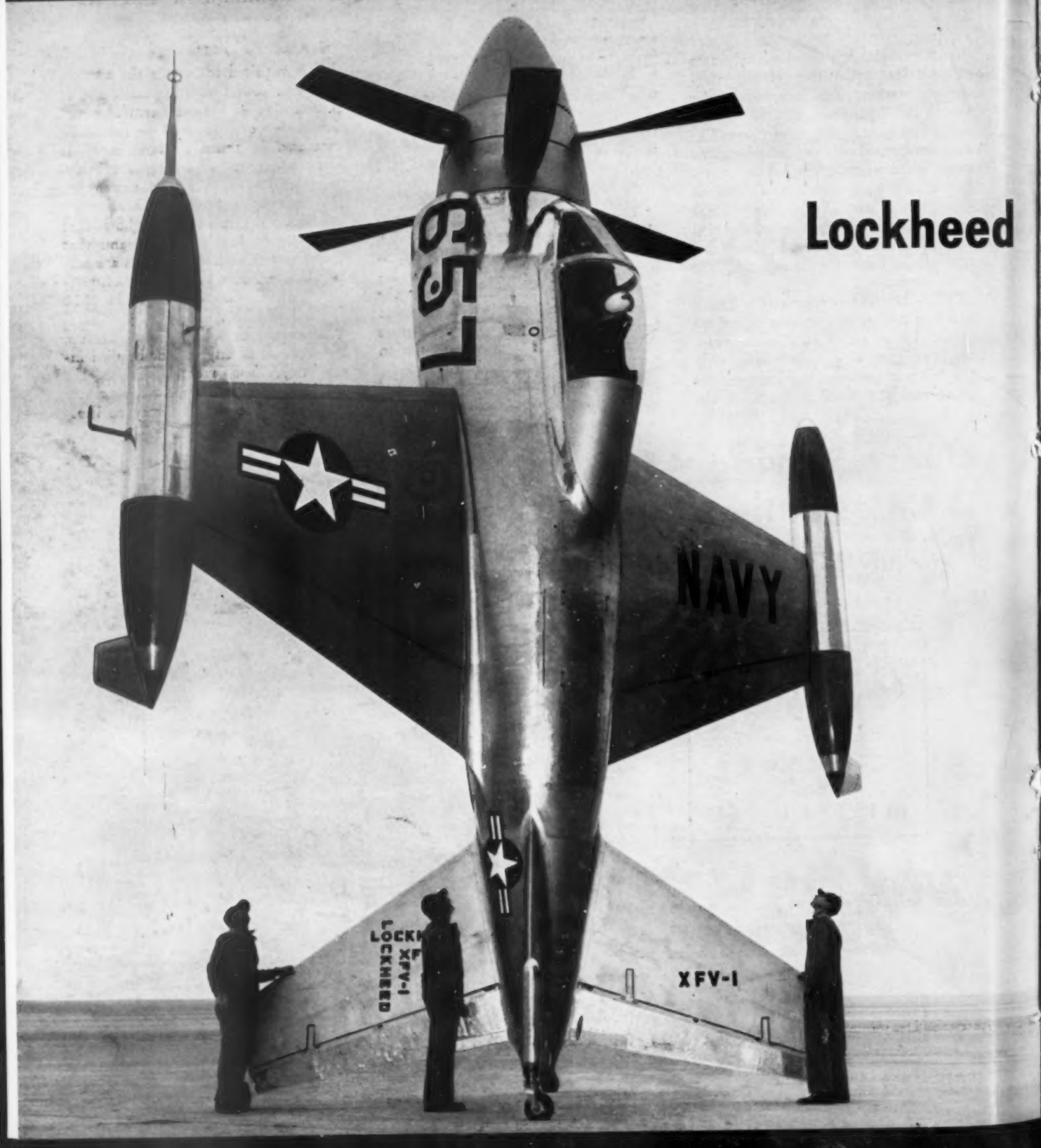
CHICAGO
and
MILWAUKEE



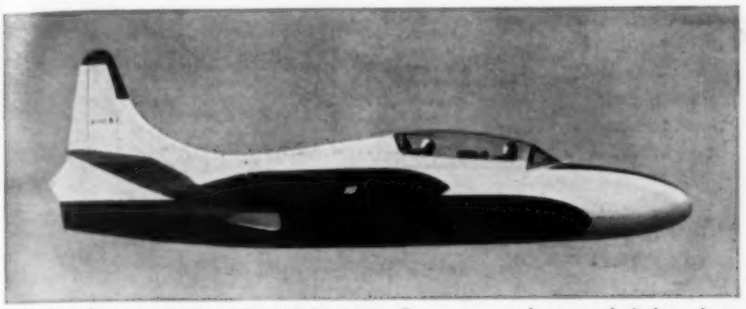
NORTH CENTRAL AIRLINES

Serving ILLINOIS • WISCONSIN • MICHIGAN • MINNESOTA • NORTH DAKOTA

SPECIAL CRADLE LIFTS XFV-1 from prone position (for servicing) to upright for vertical takeoff.



LEADERSHIP DEMANDS CONSTANT ACHIEVEMENT



WORLD'S SAFEST JET AIRPLANE. Greater power, larger cockpit, but, above all, more safety have been engineered by Lockheed into its new jet trainer. New stall slats, drag chute, Zero Reader and pilot "stick shaker" device to automatically warn about possible stall are just a few of added safety features. Trainer combines jet combat performance with maximum operational safety. Easier to fly than simple propeller-driven trainers.

GUIDED MISSILE and pilotless aircraft research is advancing rapidly at Lockheed. Here engineer-scientists from the Missile Systems Division test top-secret developments to meet problem of supersonic speeds yet unattained.

Scientists Unveil Radical Forms of Flight

High-Speed Navy Fighter Takes Off Straight Up, Lands by Backing Straight Down on Its Tail

Today's biggest news in aviation is the Navy's XFV-1 built by Lockheed, a revolutionary new vertical-rising plane.

A powerful Allison turbo-prop engine with two jet turbines turning counter-rotating propellers lifts XFV-1 straight up, rocket fashion. It levels off for speeds in the 500-m.p.h. class, lands on its tail.

Many Lockheed "firsts" are built into this airplane. A ¼-scale model powered by a 76-h.p. electric motor was built and flown to test vertical ascent, transition into level flight, and landing. Careful weight control permitted completion of first prototype hundreds of pounds less than estimated weight for Navy requirements.

Unique 4-way tail serves as a single surface and jointly functions as elevator, aileron and rudder, using revolutionary interlocking controls.

FIRST ROUND-THE-CLOCK flying radar station in the world is this Lockheed Early Warning Aircraft (designated WV-2 by Navy and RC-121C by Air Force). Huge 600-gallon tip-tanks extend radar-laden Super Constellation's range. Plane carries more scientific equipment than any other known aircraft—some six tons of electronics. Bottom radome, the size of a swimming pool, is largest plastic part ever built. Although it is held to plane by only 10 bolts (no metal ribs), radome is built to withstand aerodynamic pull of up to 60,000 pounds. Super Constellation's three-tail design insures aircraft controllability despite air-flow disturbance created by protruding radomes.

SOUND ENGINEERING pays off with Lockheed P2V Navy patrol bomber. The famous Neptune has increased gross takeoff weight and boosted speed by adding powerful jet pods. Neptune's aerodynamic configuration, however, remains unchanged from original X model 11 years ago through the current 7 series.

Lockheed

California Division—Burbank, California
Georgia Division—Marietta, Georgia
Missile Systems Division—Van Nuys, California
Lockheed Aircraft Service—Burbank, California
Lockheed Air Terminal—Burbank, California

LOOK TO LOCKHEED
FOR LEADERSHIP

NEW FLIGHT FORMS are studied by Lockheed scientists to meet sonic and thermal problems of ultra-high speed, higher altitudes. Nearly a decade of research on wing shapes alone results in new Lockheed forms in Mach 2 to Mach 3 range. Lockheed has tested almost 100 distinctly different wing models on supersonic rockets.

LOCAL SERVICE AIRLINES
Comparison of Revenue Passengers Carried
1952-1953

Carrier	1952	1953	% Increase
Allegheny	183,986	213,666	16.13
Bonanza	43,705	67,560	54.58
Central	47,167	42,496	(9.90)
Frontier	127,398	130,004	2.05
Lake Central	33,213	57,093	71.90
Mohawk	110,514	163,270	47.74
North Central	153,067	219,596	43.46
Ozark	84,463	125,220	48.25
Piedmont	224,702	270,524	20.39
Pioneer	183,271	147,584	(19.47)
Southern	121,375	112,469	(7.34)
Southwest	165,057	188,366	14.12
Trans-Texas	78,214	97,434	24.57
West Coast	143,554*	162,846	13.43
Total	1,699,686	1,998,128	17.56

*Includes Empire.

trate this is by means of the following table:

Services Performed	1950	1953	% of Increase
U. S. Mail Pay	$17,191,453	$23,996,730	39.59
Available Seat Miles Flown (000)	599,159	1,022,074	70.58
Revenue Passengers	969,428	2,034,832	109.99
Revenue Passenger Miles (000)	188,782	391,384	107.32
Total Non-Mail Revenues	$11,289,448	$24,993,374	121.39
% Non-Mail Revenues to Total Revenues	39.64%	51.02%	

Thus, for an increase of approximately 39% in mail pay/subsidy from 1950 through 1953, the nation — by any standard of measurement — has received a very substantial increase in services rendered. This is a good bargain for the nation, particularly when there appears to be no way to eliminate the subsidy without at the same time eliminating the service.

How long will subsidy be necessary? If the suggestions outlined here could be placed in operation overnight, then there is no question but that the nation's subsidy bill would be immediately decreased. But even so, subsidy would not be eliminated.

It is unlikely that subsidy to the local carriers can be eliminated within the next 5 to 10-year period. Reduction and eventual elimination are dependent upon (1) the degree to which the local carriers' route system can be strengthened; (2) the generation of substantially increased non-mail revenues; and (3) a suitable replacement for the DC-3. In the meantime, there appears to be no reason why the total local service subsidy bill should be increased beyond the level forecast for fiscal year 1955.

Reduction below the forecast level should be a natural process. A program of reduction must be geared to the profit margin realized by the local carriers. The local carriers today are in a seriously weakened position financially — not because of any general mismanagement of the airlines, but rather because we have been

LOCAL SERVICE AIRLINES
Comparison of Revenue Miles Flown
1952-1953

Carrier	1952	1953	% Increase
Allegheny	3,223,623	3,398,826	5.43
Bonanza	1,227,264	1,660,977	35.34
Central	1,705,856	1,851,565	8.54
Frontier	4,649,008	4,401,723	(5.32)
Lake Cent.	1,111,961	1,639,279	47.42
Mohawk	1,988,489	2,565,999	29.04
North Cent.	2,867,727	4,290,409	49.61
Ozark	2,681,276	3,003,772	12.03
Piedmont	5,026,904	5,927,180	17.91
Pioneer	3,849,793	3,167,678	(17.72)
Southern	3,339,729	3,022,365	(9.50)
Southwest	2,716,503	2,845,172	4.74
Trans-Texas	2,784,011	3,541,292	27.20
West Coast	2,830,795*	3,525,397	24.54
Total	40,002,939	44,841,634	12.10

*Includes Empire.

straight-jacketed by a formula which makes impossible a profit sufficient to build a reserve to pay dividends or to attain any degree of financial stability.

A premature or artificial reduction in subsidy will delay the day when a healthy reduction can be made. Reduction should be based on the profit and management record. It should not be based on a program of reduction for reduction's sake!

Destiny

(1) Local service cannot be curtailed without harm to the national economy.

(2) Short of wholesale suspension of service, the trunk carriers cannot

FLYING YOUR WAY...EVERY DAY!
WICHITA
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PARIS
FORT WORTH
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CENTRAL AIRLINES is dedicated to the task of serving the transportation needs of communities in Arkansas, Kansas, Oklahoma and Texas, including our latest addition, FORT SMITH, ARKANSAS, the home of Camp Chaffee.
Specializing in schedules which permit convenient daily inter-city travel, CENTRAL has been on the job providing service to the communities of this area day in and day out for the past five years.
Now the major metropolitan centers and cities of smaller population are only minutes away from each other instead of hours and, through our connecting service at terminal points, CENTRAL'S 23 cities and towns are linked with thousands of places both in the United States and the world having scheduled airline service.
Thus, CENTRAL AIRLINES proudly takes its place among the public service institutions of Arkansas, Kansas, Oklahoma and Texas, in the daily job of "Flying Your Way Every Day!"
CENTRAL AIRLINES
GENERAL OFFICES
MEACHAM FIELD
FORT WORTH 7, TEXAS

replace the local carriers without serious harm to their own economy.

(3) The local carriers are a permanent fixture in the national air transport system. Their form will be modified, they will be contracted or possibly eliminated in some cases, expanded in others—but they will be continued.

Definition

Local service is primarily the function of providing air service to intermediate communities, linking them to one or more large industrial or trading centers within a specified area or geographical section by the most direct routes and at the highest frequency consistent with demand.

Decision

(1) By whatever means are necessary, establish the permanent size and structure of the local carriers.

(2) Strengthen the local carriers through route consolidations, elimination of scheduling restrictions between intermediate points and terminals, and suspension of trunks at "token service" points.

(3) Avoid premature actions designed to reduce or eliminate subsidy; relate reductions to the profit margin. Reductions will be the product then of natural and healthy progress. ★★★

LOCAL SERVICE AIRLINES

Number of Scheduled Aircraft 4th Quarter 1953

Airline	1952	1953	Increase
Allegheny	12	13	1
Bonanza	4	5	1
Central	6	5	(1)
Frontier	12	12	—
Lake Central	4	7	3
Mohawk	8	10	2
North Central	10	18	8
Ozark	8	11	3
Piedmont	13	15	2
Pioneer	9	10	1
Southern	9	10	1
Southwest	9	9	0
Trans-Texas	10	15	5
West Coast	11	12	1
Total	125	152*	27

*NOTE: 1953 total consists of 150 Douglas DC-3's and 2 Martin 202's, the Martins being operated by Southwest Airways.

ROUTE RESTRICTIONS

(Continued from page 29)

tificates contain restrictions generally requiring that each flight stop at each intermediate station on each trip between terminals. The result of these restrictions has been that local carriers are almost completely excluded from traffic between terminals of any importance.

There are a substantial number of pairs of cities on the route systems of local carriers which will develop sufficient traffic for non-stop local carrier services and will provide profits for the reduction of mail pay need.

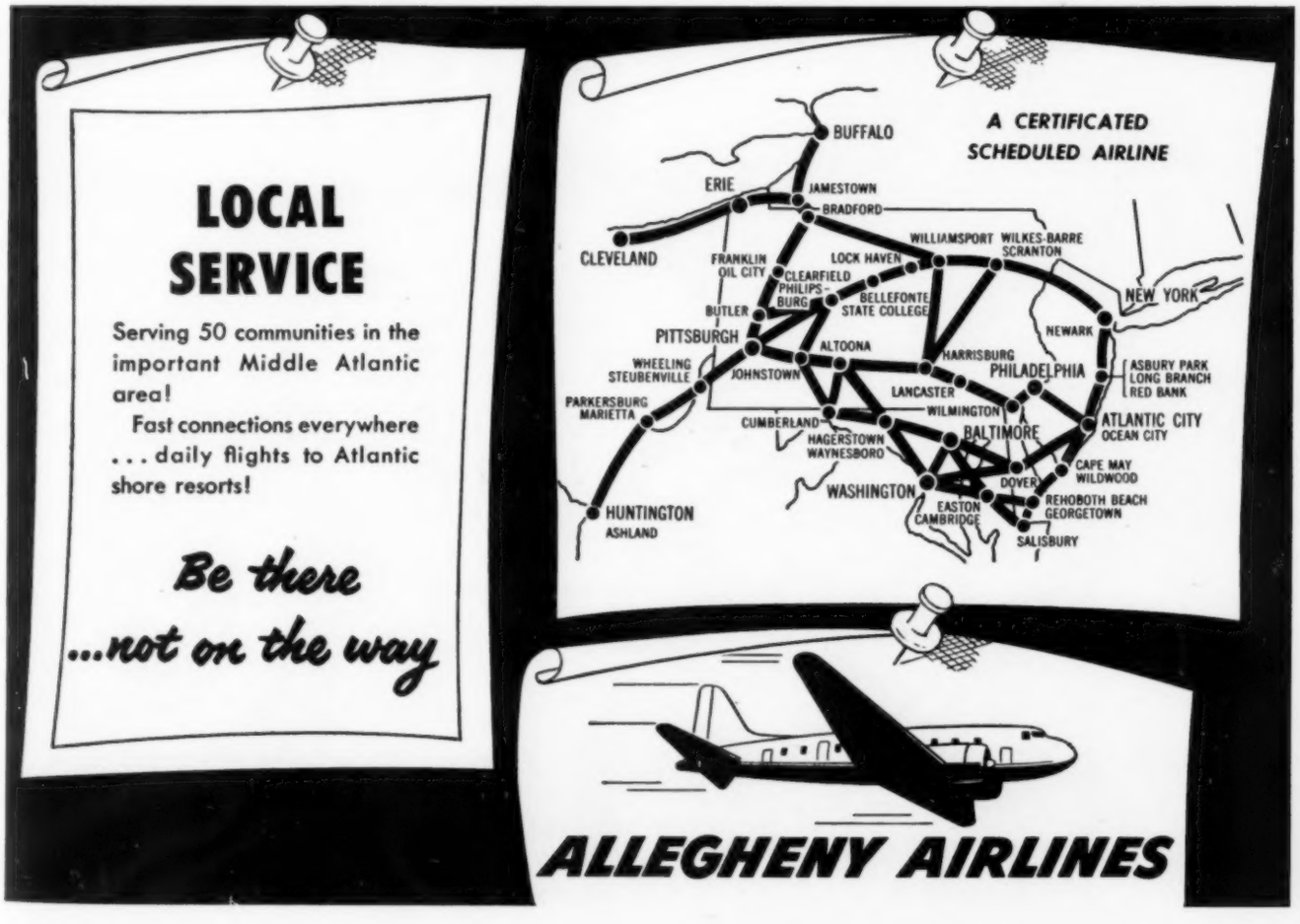
A Formula for Determining Level of Service at Fringe Stations

One of the knottiest problems facing local carrier management and the CAB is that of determining the appropriate frequency of service to be operated at fringe stations. The following are the principle variables entering into net performance at a station:

1. Number of passengers enplaned per day.
2. Average passenger haul (or average on-line ticket sale).
3. Frequency of aircraft departures.
4. Circuity in serving the station.
5. Station cost per day.

The usual situation confronting local carrier management is a scramble of all of these variables, without a clear-cut answer discernible among them. There is an obvious need for a rational, impartial and scientific means of determining and comparing the economic performance of any airline station with that of any other airline station, giving appropriate weight to each of these variable influences.

Before proceeding to a formula with this purpose, it is necessary to accept the following basic concept. Once a unit of traffic is aboard a given type aircraft at on-course cruising altitude, the cost of in-flight trans-



portation of that passenger for a mile is exactly equal to the in-flight cost for any other passenger. However, below cruising altitude, the cost per unit of traffic enplaned may vary several hundred per cent, depending upon the economics of the station involved.

We have prepared a formula designed to measure the unit cost of passenger revenues generated at a station giving appropriate weight to the above variables. By knowing the relation of such costs to the revenues generated, it becomes possible to compare equitably the performance of one station with another. The formula is as follows:

$$\frac{SC + LD + CC}{R} = CTA$$

In the formula, Station Costs (SC) are those reported on Form 41 reports. Landing and Departure Costs (LD) are the CASH aircraft operating costs of let-down, landing, taxiing, run-up, take-off, and climb, multiplied by the number of departures serving the station. Circuity Cruising Costs (CC) are the cash operating costs per mile (adjusted for that portion of direct cost already charged as LD cost) multiplied by the miles of circuity involved in serving the station. Revenues (R) are the on-line passenger revenues for the station. Cost of Traffic Aloft (CTA) is the unit cost developed under the formula per dollar of passenger revenue. For the purpose of the study, LD costs have been estimated to be $8.40 per landing and take-off, and Circuity Cruising costs have been estimated at 35c per aircraft mile.

Applying this formula to station data for local airline stations shows a range in Cost of Traffic Aloft from $0.15 to $6 or $7 per dollar of passenger revenue developed. The average Cost of Traffic Aloft for all local service stations is 69% of passenger revenues.

The important point is not so much that these costs can be measured as that after they have been measured they can be compared. In this way the sub-marginal stations can be scientificially identified for termination of service. Marginal stations which presently receive two or more round trips per day can be reduced to a daily round trip to see whether costs and revenues thereafter have a better relationship. It is certainly desirable to slough off stations which cannot be made to compare reasonably with other local service stations. The formula provides a factual organization of all of the elements in station performance. Considering the difficulties to both CAB and airline management in terminating service at a poor station, there is great value in having a measurement device which will permit impartial comparison with other stations.

So far as the local carrier industry is concerned, the only salvation lies in progress toward less dependence upon subsidy mail revenues. When that progress is arrested, as it has been in the past two or three years, remedial action must be taken. The remedy is an upgrading of local service revenues and net through progressive modification of route restrictions. ★ ★ ★

MOHAWK'S BIG STEP

(Continued from page 32)

tained in the interest of safe and efficient operations.

As a result of its thorough preparation for the New York-Newark to Liberty-Monticello helicopter passenger service, the following features of this operation are of importance and interest in the air transport industry:

1. Mohawk is the first scheduled local service airline to "take the big step" in helicopter operations and transition to helicopter flight equipment;

2. This is the first time that the helicopter has been used to bring scheduled air service to a community for which an airline has been certificated but has been unable to supply that service because of inadequate airport facilities;

3. Mohawk's helicopter operation marks the first use of thoroughly

TULSA MUNICIPAL AIRPORT

BONANZA
AIR LINES

Backed by seven years' successful operating experience, bringing air transportation for the first time to many areas, Bonanza has now applied for the new routes shown by the **dotted** lines. DC-3's used exclusively.

Executive Offices
McCarran Field
Las Vegas, Nevada

seasoned airline pilots as helicopter pilots;

4. Mohawk's helicopter is not only the lightest S-55 in passenger operations, but it is also the quietest and most comfortable for the passenger, and is the only certificated helicopter in the United States having capacity for 8 passengers, baggage and mail; and

5. The 82-mile route between New York-Newark and Liberty-Monticello is the longest non-stop scheduled helicopter route in the United States.

★ ★ ★

PERMANENT CERTIFICATION

(Continued from page 25)

trunks as proposed by the ACC report? In previous local service editions of this magazine, other trunkline presidents have wisely stated that the local carriers, as specialists in short-haul air transportation, not only will do a more economical job but also provide better local service than the trunk system. If the trunks should be forced by shortsighted government policy to take over most of the local stops, or should the feeder business given the trunks by the short-haul operators drop off precipitously, we might easily find the ironical situation of the now self-sufficient trunks going back on the subsidy feed trough! The hatchet men of the Republican administration might well ponder that possibility.

Subsidy the Pay-off

Speaking before the American Association of Airport Executives last month in Louisville, CAB Member Josh Lee had this to say about Board policy:

"There are indications of growing impatience with the local airline subsidy. I favor the reduction of subsidy, too, but am unwilling to concede that the absorption of the local airlines by the trunk-lines would in the long run result in any beneficial economies to the government. If the local carriers were to be absorbed by the trunks for the immediate expediency of terminating the subsidy, the air traffic at the small and intermediate communities would dry up because the trunks would provide them with the meagerest possible service required under the law . . . one after another the smallest communities would be dropped. The intermediate-size communities would then be the smallest and some of them would be dropped and thus the well springs of new traffic would be dried up at the source. Why, you ask, is such a policy being considered? The answer is, because the cost to the government of the local airlines stopped going down and jumped up 6 million dollars in the last two years."

There is one area in which all CAB members agree. The locals should not compete with the trunks. From time to time this bugaboo jumps out in the open but the Board is adamant against it and the remoteness of it happening in any considerable degree precludes any long discussion of it at this point.

It is estimated that for the fiscal year of 1955 subsidy payments to the local service airlines will be between $23 million and $24 million.

Who actually receives this subsidy? A thorough check of the local service carriers' profit and loss statements reveal they don't get it, for only five of the carriers broke even last year and the average loss for the group was about a cent per mile. One carrier ran about 2 cents per mile in the black which made a profit of 4.3 per cent, which is still far below the 7 or 8 per cent profit on investment the Civil Aeronautics Board has used consistently figuring a fair rate of return.

The 437 cities and towns receiving local air service are the ones who get

Allison turbo-prop engines rated at 3,750 hp. each power the military YC-131C version of the Convair 340. —(Convair Photo.)

Turbo-prop Convair-Liner Flies

CONVAIR last month began flight-testing America's first twin-engine turbo-prop transport, the Convair YC-131C.

The YC-131C is a Model 340 Convair-Liner converted to turbo-prop power. Two are being converted by Convair's Fort Worth Division under an Air Force contract. The second plane will be flight-tested later in the summer. Both are to be used flying test beds for turbo-prop engines. Conversion kits are to be made available to airlines.

In the conversion, the Convair's 2,400-hp. Pratt & Whitney piston engines of the commercial airline version have been replaced with two Allison YT-56 turbo-prop engines developing 3,750 hp. each. The increased power of the turbo-prop engines will give the YC-131C a top speed considerably higher than the 315 mph. of current airline versions and also will provide substantially greater payloads. Gross weight of the commercial Convair-Liner with piston engines is 47,000 lbs. Modification included re-design of the engine nacelles and a slight increase in rudder and elevator surfaces.

First flight of the conversion was made by B. A. Erickson, who heads the Convair-Ft. Worth flight department. Co-pilot was L. C. Brandvig and flight engineer was J. D. McEachern. They reported excellent handling characteristics with the greatly enlarged power available from the turbo-prop engines.

Performance figures for the YC-131C, as given on first-flight covers carried on the flight-test for Convair employes, include the following:

High Speed (25,000 ft.), 318 knots.
Normal Cruise Speed (30,000 ft.), 287 knots.
Rate of Climb, 2,380 ft. per min.
Range, 1,710 miles.
Service Ceiling, 36,300 ft.
Single-engine Service Ceiling, 18,000 ft.
Fuel Capacity (JP-4), 1,730 gals.
Take-off Distance, 3,000 ft.

First flight of YC-131C was made on May 20 at Ft. Worth. Pilot B. A. Erickson reported he found the conversion to be an "excellent marriage of power plant and airframe." —(Convair Photo.)

the subsidy, especially the 258 towns that are "pure" local service stops. The fare-paying passengers, the users of the air mail and cargo services, plus the trunk lines who get the long-haul portion of the ticket sold by the local airline at no sales cost to the trunks — these, too, must be figured in on the gravy of subsidy payments to the local service carriers.

Of the 6,000 local service airline employes, 3,000 are pilots, mechanics and technically trained personnel who would be indispensable to our nation in case of war. Just how much do you estimate it would cost the taxpayers for the U. S. Air Force to maintain a ready reserve of 3,000 highly trained all-weather, airline-rated pilots, competent mechanics and other technical aviation people the schools are no longer turning out? Honesty forces the admission that part of the subsidy to the locals must be charged to national defense. Some of us who saw the pitiful air-lift deficiencies in World War II and in the Korean mess are inclined to believe that this ready reserve of men and machines and know-how is well worth every cent of the $24 million.

Josh Lee in his speech to the AA of AE pointed out that last year the locals carried 316 million letters at six cents each for a total of $18,968,-769. If these letters had borne eight-cent air mail stamps instead of six-centers, the revenue would have paid the entire local carriers' mail bill with $2,185,756 left over! Costs of handling the mail and the fact that other carriers hauled some of it part of the way is not figured in. But you can't get away from the fact that the 14 locals carried mail that brought in almost $19,000,000.

What has the myopic Republican tightwads worried is a recent reversal in trend in break-even need. From 1947 to 1952 the cost to the government dropped from 70.63 cents per plane mile to 48.91 cents. In 1952 it jumped back to 51.71 cents and last year to 53.40. Everybody knows what happened. Revenues continued their happy rate of increase but costs began to soar and overpowered the increases in revenue. It figures about $6 million increased cost to the government for the last two years.

The rate section in the CAB has been so zealous in hitting the locals over the head on mail pay and cost considerations that the long range viewpoint of strengthening the operators has disappeared. Actually the locals are getting weaker from the mail rate policies rather than stronger. We doubt very much if the policy is

actually saving the government any money while it is apparent that it is complicating the locals' operating problems and making it still more difficult to improve their financial structures by attracting investment capital they need so desperately. It is clearly a case of Uncle Sam inviting a man to go into a certain business, then hitting him in the head for going into it!

Post Office Attitude

The historical attitude of the Post Office Department to improve air mail service to the general public has gone out the window. The Department used to have people in it who would give thought to developing new methods and procedures that might speed up or increase the efficiency of handling mail in future years. This attitude has been supplanted by one to save money first, then consider the service later.

The Post Office used to figure it was an obligation to expedite mails wherever possible, especially to more isolated spots on the map. Years ago Congress set up the rural free delivery, realizing that it would never be self-sustaining but that it was necessary to the nation. Last year RFD cost Uncle Sam $192 million. The people want it and even the Republicans would have a tough time doing away with it, no matter what the cost is. Unfortunately local air service isn't that strong politically.

It is true that the Post Office has had vision enough to experiment with first class mail by air. But the incentive here is one of saving money — not better service alone. They found out that the carriers would accept the mail at less cost than surface carriers. Better service is a secondary consideration. The 30-cent-per-ton-mile rate which was accepted arbitrarily by the locals is a grave mistake. It would have been better for each line to negotiate separately with the Post Office Department on the basis of different conditions at different points. For example, if a surface carrier gets a $1.00 ton-mile rate the local could come along and do it for 90 cents. The The Post Office Department would be saving money from the present arrangement by surface and the air carrier could make money on the service rendered. We do not see how the short-haul carriers can make money at the 30-cent rate. There was a time when leadership within the Post Office Department would be concerned with the economic health of the people who carried its precious mails and provided ever-improving service to the patrons. That spirit no longer exists.

All in all, the steady record of growth of our nation's local service air carriers as reflected in this issue of FLIGHT MAGAZINE speaks for itself and definitely presages even greater accomplishments in the years to come if the local carriers can only operate under enlightened Federal policy — akin to the policy that gave birth to our present successful trunk airline system. Right now that kind of enlightened policy for building something valuable and self-sustaining a few years from now is disappearing fast.

If this administration starts reducing our present airline services they will only have to restore them later on. The American people realize we can't exist without an adequate air transportation system and that instead of having too much we actually have too little. The trouble is that Mr. "Mainline" Murray of the Department of Commerce and Air Coordinating Committee and his cohorts of Johnny-come-lately aviation experts don't know it. The damage they threaten to do, probably and partly inspired by jealous surface carriers, is considerable. An aroused American public working through an aroused Congress can alone put a stop to the lethal philosophy that civil aviation in the United States must be curtailed rather than expanded. We can not afford the luxury of waiting until World War III breaks out to start covering up the damage done by aviation's Fifth Column today. ★ ★ ★

Comparative Traffic and Revenue, Trunk Carriers, 1938; Local Carriers, 1953

	All Domestic Carriers* 1938	Big Four Carriers** 1938	Domestic Carriers Other Than Big Four 1938	Local Airlines 1953
Mail Revenue	$15,751,408	$10,125,471	$ 5,625,937	$24,182,057
Non-Mail Revenue	$26,499,322	$21,128,612	$ 5,370,710	$24,318,531
Total Revenue	$41,250,730	$31,254,083	$10,996,647	$48,500,588
Profit	($ 967,177)	($ 1,278,581)	($ 212,742)	($ 1,149,118)
Revenue Miles Flown	68,543,355	48,481,958	20,061,397	44,841,634
Revenue Passengers	1,168,489	804,768	363,721	1,998,128
Revenue Passenger Miles	475,599,717	369,773,419	105,826,298	336,881,000
Pounds Air Mail	22,890,968	15,958,891	6,932,077	10,596,400‡
Mail Ton-Miles	7,446,590	5,903,973	1,542,617	976,003
Route Miles	34,517			

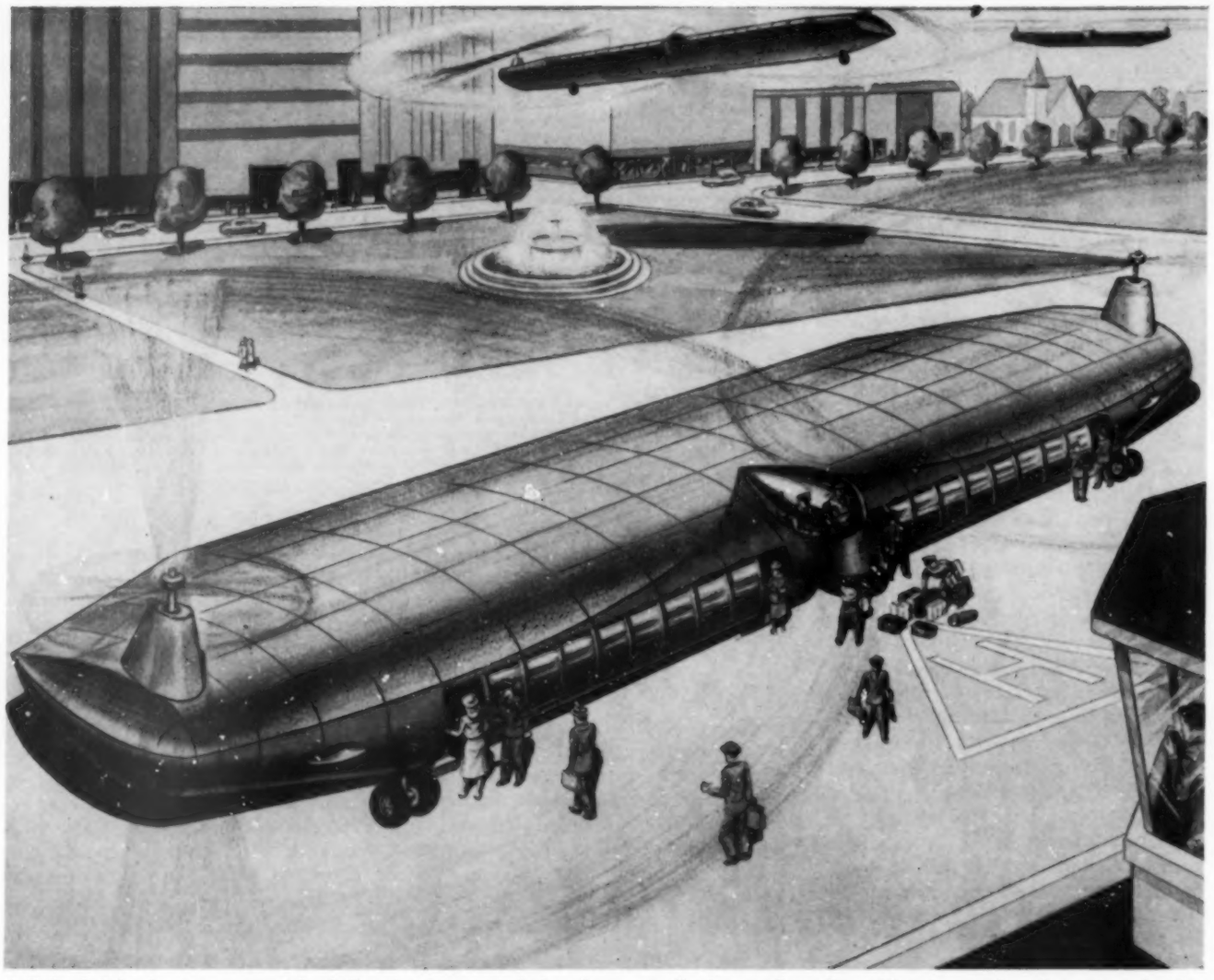
—Table from CAB records.

*American Airlines, Inc., Braniff Airways, Chicago and Southern Air Lines, Colonial Airlines, Continental Air Lines, Delta Air Corporation, Eastern Air Lines, Inland Air Lines, Mid-Continent Airlines, National Airlines, Northeast Airlines, Northwest Airlines, Pennsylvania-Central Airlines Corp., Transcontinental & Western Air, United Air Lines Transport Corp., Western Air Lines, Inc. **American Airlines, Inc., Eastern Air Lines, Transcontinental & Western Air, United Air Lines Transport Corp. ‡Twelve months ending 3d Quarter, 1953.

Local Service Certificate Authorizations

Carrier	Effective Date	ORIGINAL CERTIFICATE Date of Service Inauguration	Term	Expiration Date	RENEWED CERTIFICATES First Renewal Term	First Renewal Expiration Date	Second Renewal Term	Second Renewal Expiration Date
Allegheny	1-49	3-49	3 yrs.	1-52	5 yrs.	12-56		
Bonanza	11-49	12-49	3 yrs.	12-52	In process			
Central	11-46	9-49	3 yrs.	5-50	4 yrs.	2-56		
Frontier	3-46	11-46	3 yrs.	3-49	6 yrs.	3-55		
Lake Central	2-48	11-49	3 yrs.	2-51	4 yrs.	12-54		
Mohawk	6-48	9-48	3 yrs.	6-51	7 yrs.	6-58		
North Central	10-47	2-48	3 yrs.	10-50	5 yrs.	9-55		
Ozark	9-50	9-50	3 yrs.	9-53	In process			
Piedmont	12-47	9-48	3 yrs.	12-50	7 yrs.	12-57		
Pioneer	11-43	8-45	3 yrs.	12-46	3 yrs.	11-49	5 yrs.	9-54
Southern	2-49	6-49	3 yrs.	2-52	5 yrs.	12-56		
Southwest	5-46	12-46	3 yrs.	11-49	5 yrs.	9-54		
Trans-Texas	11-46	10-47	3 yrs.	5-50	4 yrs.	3-54		
West Coast	5-46	9-46	3 yrs.	9-49	5 yrs.	9-54		

—April, 1954.



Artist's sketch of a new concept for helicopter transport design shows an all-wing configuration with rotors and engines at each wing tip. Cabin windows are in leading edge of wing, which generates lift at cruising speed. Rotors may be partially unloaded for high speeds. —(Bell Aircraft Sketch.)

Flying-Wing Helicopter

New Bell Rotor-Wing may solve twin-engine copter design problems

A NEW concept of transport helicopter design has evolved from flight-testing of a conventional configuration. It is a "side-winder" design — instead of pointing its nose in the direction of flight, it travels sideways.

Bell Aircraft Corporation has confirmed that it is in the preliminary design stages of what it calls a "rotor-wing" helicopter. The configuration is that of a flying wing.

It all had an unusual beginning. Bell pilots have been flight-testing for months a Navy anti-submarine helicopter now in production by Bell at Fort Worth. This model has tandem rotors, one at the nose and one at the rear end of the cabin-type fuselage. A single Pratt & Whitney R-2800 engine drives both rotors through a system of transmissions and shafts. In addition to the big engine, the cabin also houses elaborate electronic gear for locating and stalking submarines beneath the surface.

In their schedule of flight-testing, the company pilots began to favor sideways flight over other directions of travel. "It just felt better," one of them explained. Then they and the engineers got to speculating over the advantages of flying sideways instead of forward. This led to a full-fledged company study of the novel idea.

Harvey Gaylord, Bell vice president, says the new design presents an entirely new concept in rotary-wing aircraft. He expects it to be proved as an effective approach to the demand for large passenger and cargo craft having multi-engine reliability.

The Bell design eliminates the customary fuselage and resulting inefficiencies inherent in other side-by-side rotor configurations, which have long been explored. The Bell official says laterally-disposed rotors are more efficient for twin-engine helicopters than tandem or single-rotor configurations in forward flight — particularly

at minimum-power speed which is so important for one-engine-inoperative operation as required by the CAA and the airlines.

Instead of housing passengers or cargo in a tubular cabin and hanging engines outboard, the new design makes a thick wing out of the fuselage. The seats are installed to face the leading edge, which has a series of windows to allow for forward vision. In the tips of the wings are the engines, which drive rotors mounted atop the wing tips. Landing gear beneath the tips is retractable. A pod at the center of the thick passenger wing houses the control cabin and crew.

"The idea is for the wing to generate some of the required lift at cruising speed," said a Bell spokesman. "This will allow for a partial transfer of lift from the rotors to the wing during cruising flight. We can thus reduce rotor and engine operation during cruise in a manner similar to fixed-wing airplanes. Reduction of rotor speed during flight has never before been possible in conventional helicopters. This will result in lower fuel consumption and extended range."

It is also believed that the new design will be capable of greater speeds than the best of current configurations.

During initial stages of development, the Bell flying-wing helicopter will be powered by piston engines but provision is made for the future use of gas turbines driving the rotors through a transmission. The two engines are geared together so that either or both engines can drive the two rotors. In event of failure of either engine, both forward flight and lift will be adequately maintained.

Excellent auto-rotation capabilities are claimed by Bell for the rotor-wing. Its big tandem-rotor HSL anti-submarine helicopter recently demonstrated that it, too, has excellent auto-rotation capabilities, with test pilots making landings without power.

Bell has not discussed any figures in the specifications or performance of the side-winding rotor-wing. However, it appears on the drawing board as about the size of the Convair 340 fixed-wing airliner. This would give it 40 seats for passengers, a useful load of 5 tons or more and about 4,000 to 4,800-hp. for its two engines. Indicated performance, while not cited by Bell, would apparently include a cruising speed of better than 140 mph. This would enable it to out-perform the faster fixed-wing transport in short-haul operations as the rotor-wing would operate from city center to city center, eliminating passenger ground travel to and from outlying airports required by fixed-wing transports.

The wing would be 8 ft. or more thick and would have two rows of passenger seats — all facing forward. This would provide forward view for all passengers, a condition not possible in any other aircraft design.

What about control problems, with the heavy engine and rotor installations out at the wing tips? Bell says incorporation of "accelerometer control" into the design will eliminate sensitivity to gusty wind conditions and also will eliminate fuselage oscillation during flight. Gaylord pointed out that the accelerometer control developed by Bell has been demonstrated to the National Advisory Committee for Aeronautics and the armed forces during the past two years and the results of its operation are to be disclosed late this month to the American Helicopter Society at its annual forum in Washington, D. C.

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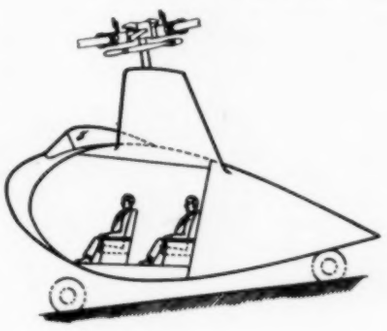
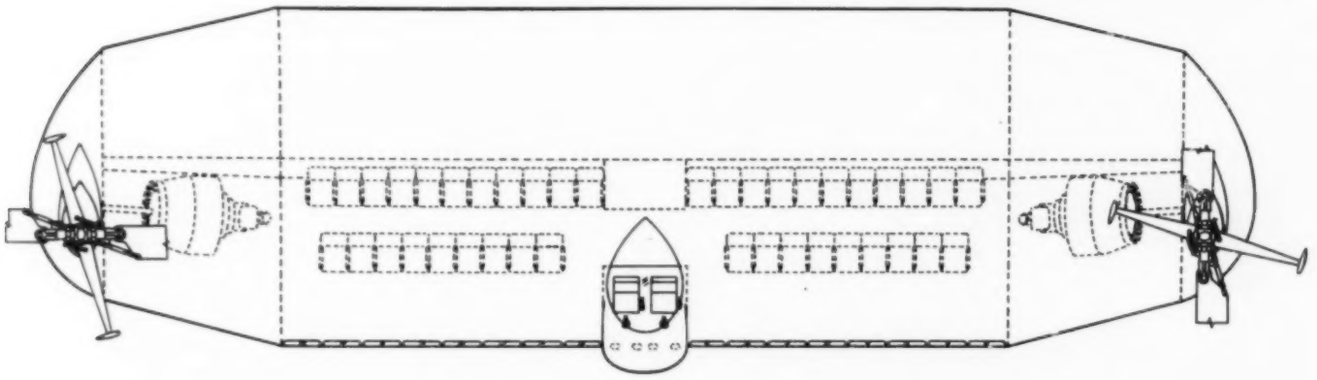
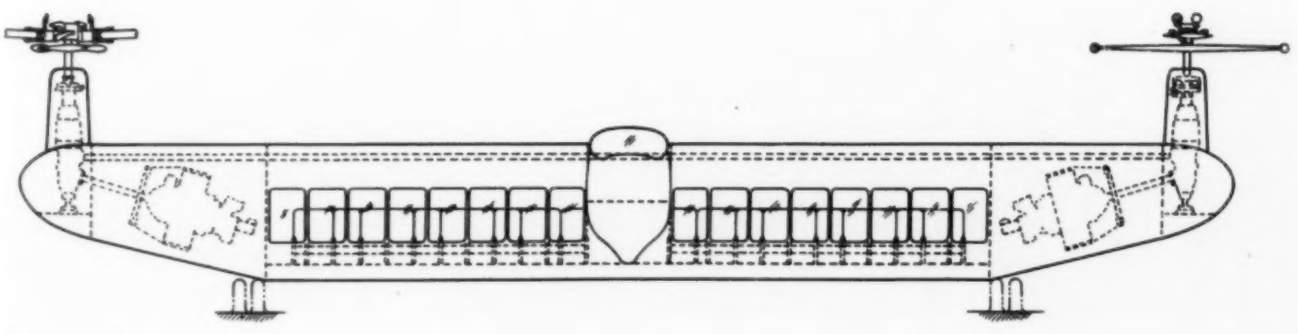


Bell Aircraft released these drawings of the Rotor-Wing but has not given out specifications or proposed performance data. However, 40-seat cabin would place it in Convair 340 category for size and engines are probably Pratt & Whitney R-2800's as used in Convair. Wing thickness would appear to be 8 ft. or more. Rotors have connecting drive shaft so that both could be powered by a single engine.

—(Bell Aircraft Drawings.)





A swept tail distinguishes the new 5-7-place Aero Commander 560 from its predecessor Model 520. Numerous improvements include added power, increased performance, greater payload and added equipment. The new version grosses 6,000 lbs., cruises at 200 mph. on 23 to 25 gals. of fuel per hour and is to be available with new 3-bladed Hartzell full-feathering propellers which eliminate vibration and reduce noise. —(Aero Design Photo.)

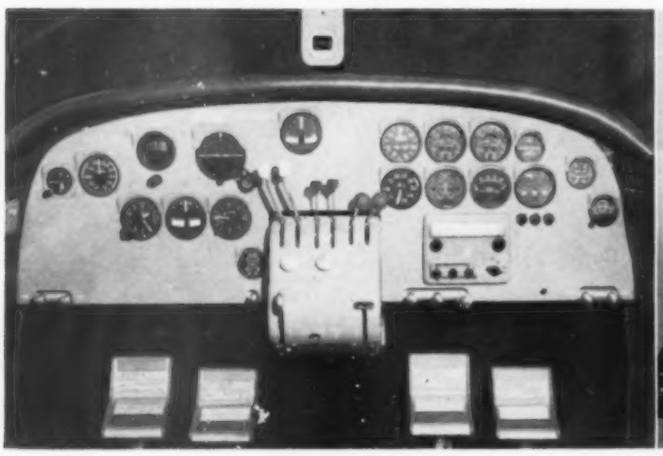
The New Aero Commander 560

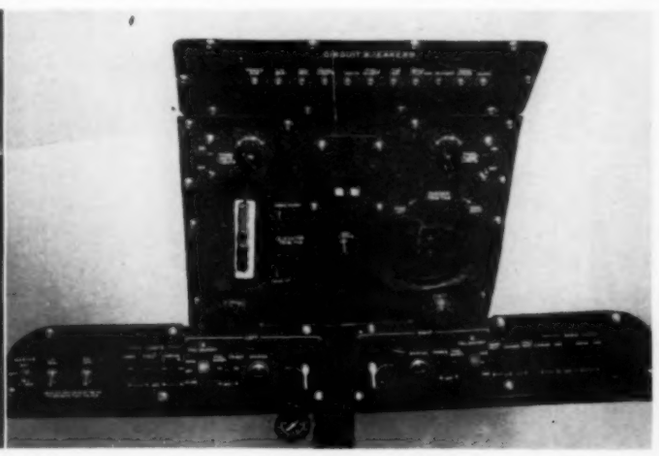
Production of a new model launches Aero Design on its second stage of growth

A NEW-MODEL Aero Commander with many improvements for greater utilization and more performance has been announced by Aero Design and Engineering Co. The Oklahoma City aircraft manufacturing firm, newest in the expanding industry serving business flying, won immediate acceptance for the Aero Commander when it delivered its first airplane in January, 1952, producing 150 of the high-performance light twins in less than 28 months. They are in use around the world and some corporate-owners have re-ordered and are already operating more than one Commander.

"As a new organization with a new product, we have made it over the hump and production of our new model marks our successful emergence from the difficult primary stage in establishing our company on a firm footing for future progress and developments," Rufe Amis, president, said in making the announcement. "For this we are grateful to those who

Standard instrument panel with blind flying group offers plenty of space for custom installations. An overhead switch panel hinges at the forward edge for easy servicing. —(Aero Design Photos.)





have helped us come so far in so short a time. The Aero Commander has been an outstanding aviation achievement, but we are now in a position to make even greater contributions to the advancement of business flying."

The new Aero Commander is the Model 560. Chief among its advancements over the earlier Model 520, which it replaces on a production line which is turning out 5-8 airplanes per month, are more horsepower, a greater payload, increased cruising speed, new propellers for smoother and quieter operation, more efficient nacelles for better engine operation, more stability and controllability at low speeds and for single-engine operation despite greater useful load, new features included as standard, increased center of gravity range limits and a new tail configuration featuring swept-back surfaces for the first time on a non-military airplane.

The Model 560 has a cruising speed of 200 mph., this being at 10,000 ft. using 70 per cent of available power. The earlier Model 520 had a 197-mph. cruising speed at 10,000 ft. using 70 per cent of available power. Fuel consumption for the new model at this power setting and altitude is said to average between 23 and 25 gals. hourly. Fuel capacity is 150 gals.

Single-engine service ceiling at 6,000 lbs. gross weight is 8,000 ft. At 5,500-lb. gross, it is 9,000 ft. Rate of climb at 6,000-lb. gross and at sea level is more than 1,400 feet per minute on both engines and 325 fpm. on one engine.

Sea level stall speed at 6,000 lbs. gross is only 40 mph. with power on. It is 59 mph. with power off. With a top speed of 209 mph., the Model 560 thus has a speed range of more than 5 to 1.

(Continued on page 84)

Standard Aero Commander features a comfortable 3-place rear seat but optional seating for roomy cabin includes individual adjustable seats for all occupants. Design features knee-high cabin entry door beneath high wing and large window areas for visibility.

—(Aero Design Photos.)

Sweepback of tail surfaces, first on commercial aircraft, effects longer arm of moment for control areas to achieve increased stability, especially at low speeds and with one engine inoperative. New nacelle is aerodynamically cleaner and features dual air induction with straight-line exhaust augmentors. Lycoming engines are rated at 270 hp. each for take-off with 260-hp. continuous rating.

—(Aero Design Photos.)

The first four Cessna Twins to be flown are shown above. First delivery will be made this month or next but production will be moderate until the end of the year, reaching one twin daily early in 1955. —(Cessna Photo.)

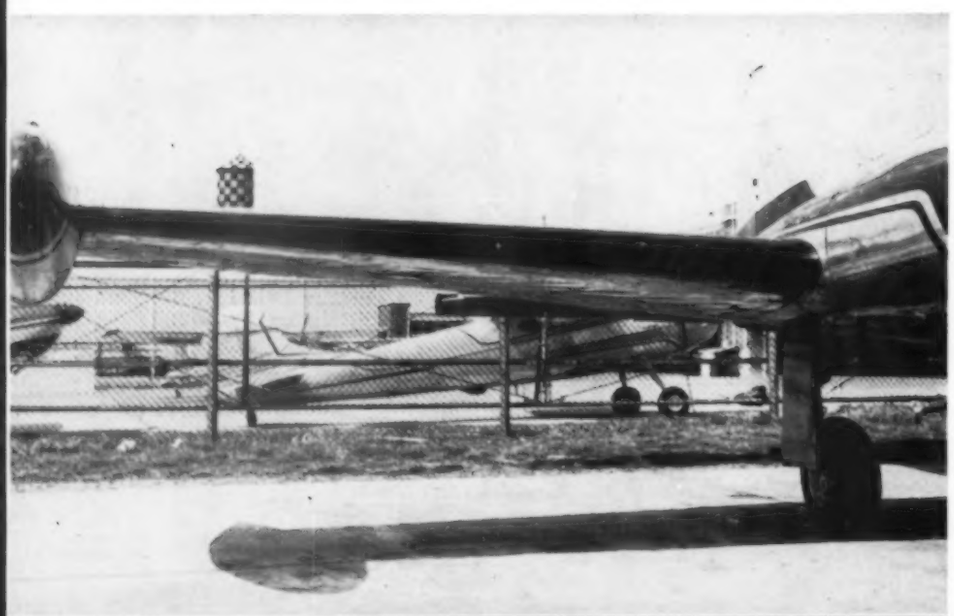
New Boots and Alcohol System for Cessna 310

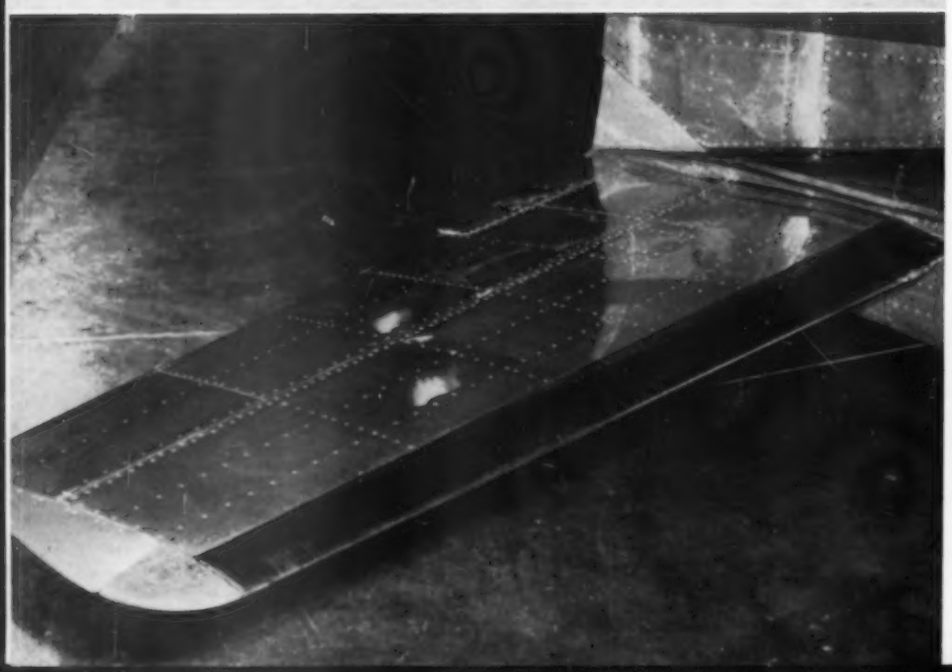
SEVERAL new developments are under way at Cessna Aircraft Company which will add materially to the usefulness of the new twin-engine Cessna 310. Meanwhile, the factory's nationwide demonstration tour has swung into high gear with a second demonstrator taking to the field. The first delivery of a 310 will be made in June or July to Distributor Mel Walston at East Alton, Ill. Orders now taken for the $49,950 Twin will be filled in June, 1955.

First new development for the 310 is a complete de-icing and anti-icing system which was completed last month.

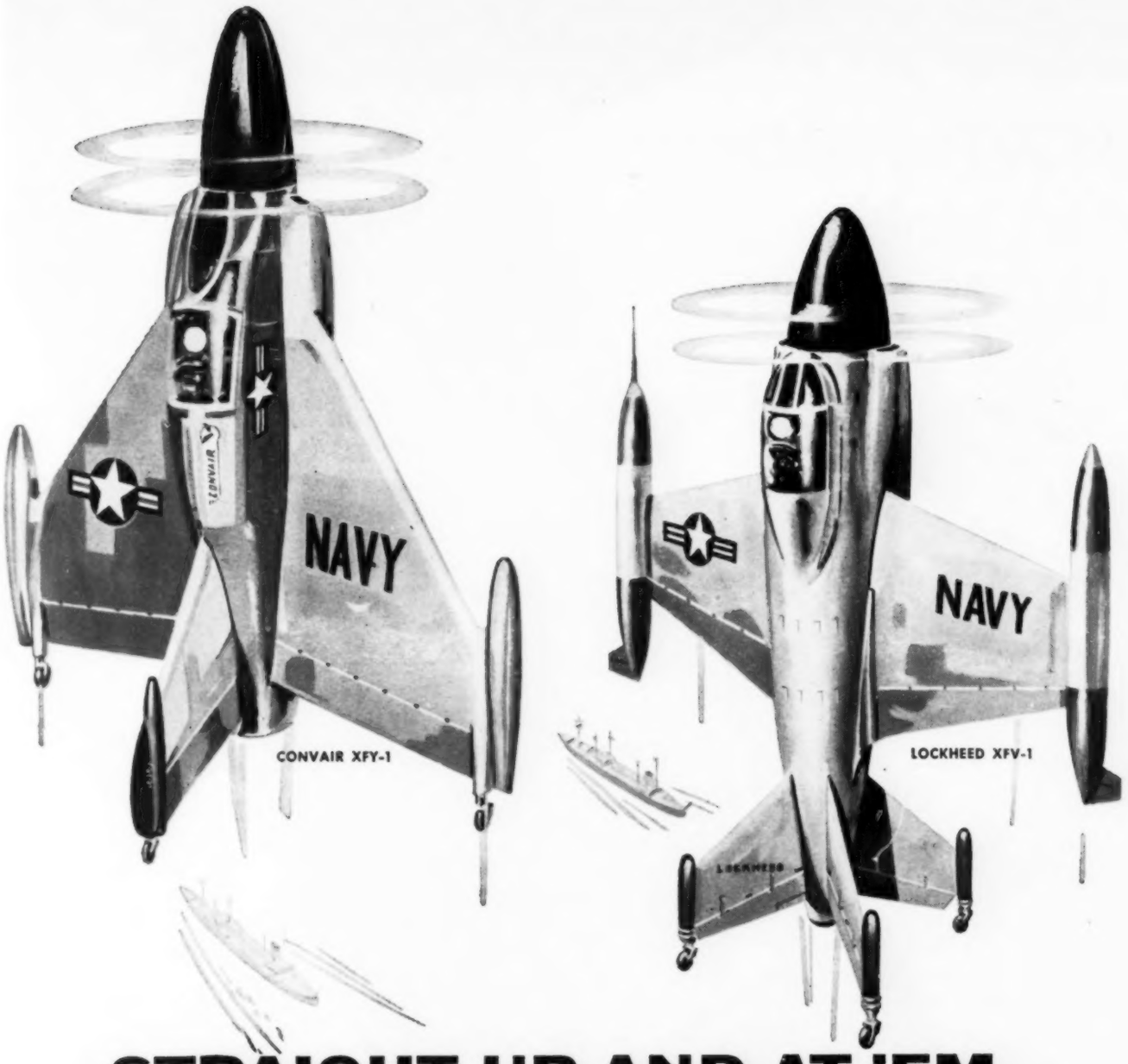
Also being developed is an air conditioner. This is due for completion and pricing by June, 1955. Later in 1954, Cessna will come out with a semi-portable oxygen system for the 310, dual ILS and an emergency exit, the latter being required for Canadian

(Continued on page 92)





Leading-edge wing and stabilizer de-icing boots for the Cessna 310 are shown at left. A propeller anti-icing installation on the Cessna is shown below. Installed prices are $4,750 for the boot system and $635 for the propeller system. Factory says normal flight performance is virtually unaffected by the boots. —(Cessna Photos.)



STRAIGHT UP AND AT 'EM

U. S. Navy VTO Fighters powered by ALLISON Turbo-Prop Engines

HERE you see the Navy's approach to the problem of providing protection for wartime convoys – two revolutionary new interceptors that take off vertically and can operate from the deck of a freighter or from any ship the size of a destroyer.

Both the Convair XFY-1 and the Lockheed XFV-1 are powered by an Allison twin-power section Turbo-Prop engine delivering more than 5500 horsepower.

These new planes combine the take-off and landing features of a helicopter with the high-speed performance of a fighter plane. They require no runways, can land in a very small area. Without the dual rotation feature of the Allison T40 Turbo-Prop engine, flight control would be impossible during take-off and landing.

Now undergoing preliminary testing, these experimental VTO fighters are further evidence of the far-sighted policy of the Bureau of Aeronautics in sponsoring Turbo-Prop development. Allison is proud to be supplying the engines for both of these planes—proud, too, of its leading role in the design and manufacture of this promising new type of aircraft power.*

GM GENERAL MOTORS Allison
DIVISION OF GENERAL MOTORS, INDIANAPOLIS, INDIANA

**Also Builders of T56 Turbo-Prop engines and J71, J35 and J33 Turbo-Jet engines.*

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To implement this final link in CAA's common system of VHF navigation, Narco introduces its Model UDI-1 Distance Measuring Equipment for commercial and corporate aircraft use.

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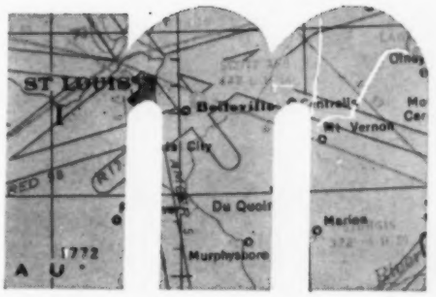
This fine, new airline-tested DME, introduces Narco's new Sapphire line of navigation and communications equipment designed to the highest possible electronic standards unsurpassed for reliability and performance.



choose *narco* DME for these superior points...

- **Exclusive crystal tuning**
- **Unitized construction for efficient servicing**
- **Backed by a nationwide network of especially-equipped DME service centers**

Weighing less than 33 pounds, Narco DME equipment consists of a remote unit mountable on a standard ½ ATR rack, a channel selector, and panel-mounted instrument which indicates distances in two ranges 0-200 miles and 0-20 miles.

narco

NATIONAL AERONAUTICAL CORP.
Ambler, Pennsylvania

Thousands of Boeing employes watched the roll-out of the firm's first jet transport at Seattle last month. Note sweepback of wings, ramp worker standing beneath wing by landing gear and wide spacing of engine pods.
—(Boeing Photo.)

Boeing's Jet Transport

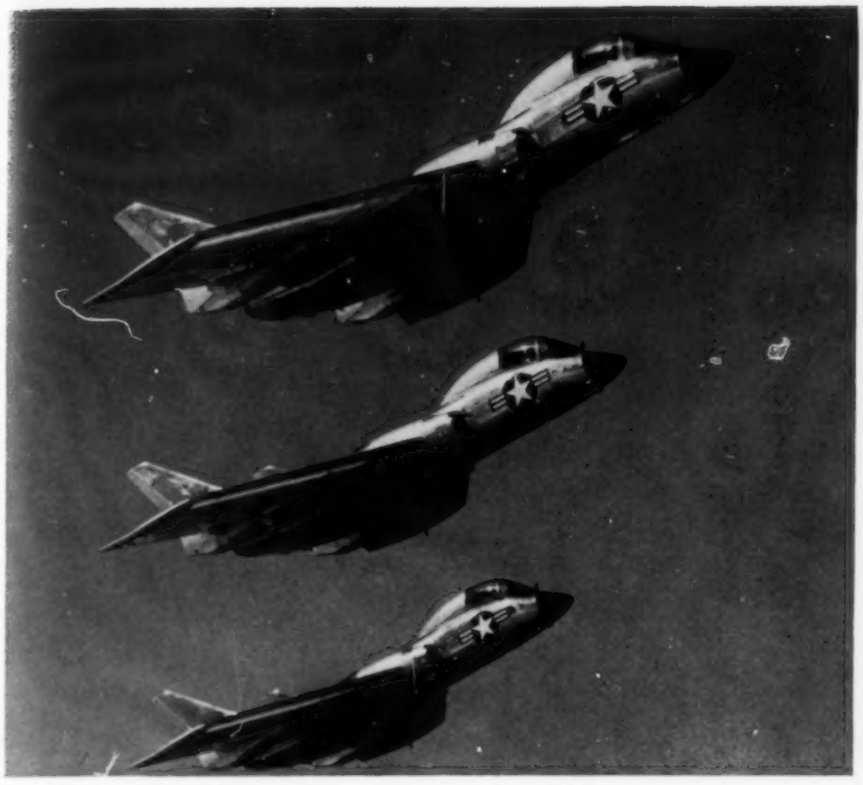
FIRST jet transport built by a U. S. manufacturer is Boeing Airplane Company's experimental designed for demonstration as both a passenger carrier and as a military tanker for aerial refueling of jet planes. Months ahead of schedule, it was rolled out on May 14. Flight tests are to begin during the early summer, following extended taxi tests, Boeing said.

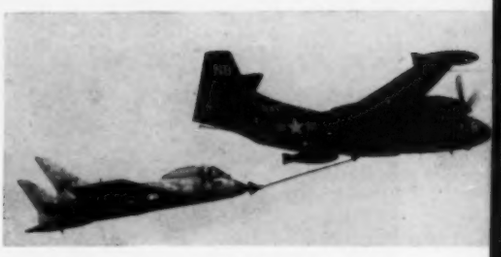
The new Boeing Model 707 was designed for cruising speeds of about 550 mph. It is powered by four Pratt & Whitney commercial JT3-L engines, similar to military J57 engines which are rated in the 10,000-lb. thrust class. Pod installation of engines is a distinctive design feature.

Boeing describes the transport-tanker as a 190,000-lb. airplane, with 130-ft. span and 138-ft. length. It is the third largest swept-wing jet airplane type built by Boeing and the world's first transport designed with sharply swept-back wings. First of these Boeings was the B-47 Stratojet bomber, which made its first flight in 1947. It was followed by the B-52 Stratofortress which first flew in 1952 and has been placed in quantity production as a long-range jet replacement of the B-36.

Commercial possibilities influenced Boeing's decision to produce the prototype of the jet transport. Depending on range and payload requirements, it will carry from 80 to 130 passengers and will cruise 550 mph. at an optimum operational altitude between 30,000 and 40,000 ft. Range would be sufficient for 7-hr. non-stop New York-London and 5-hour domestic transcontinental non-stop schedules as a commercial airliner. ★ ★ ★

These first photos show plan-form of Boeing jet transport-tanker. Fuselage length is 138 ft., span is 130 ft., and height is 38 ft. Four Pratt & Whitney JT3-L engines give 190,000-lb. plane 40,000 lbs. of thrust or more for 550-mph. cruising speed between 30,000 and 40,000 ft. As airliner, it would carry 80 to 130 passengers depending on range, which is sufficient for New York-London non-stop service.
—(Boeing Photos.)





The F7U-3 Cutlasses at left are in service with the Navy, with more of the tailless fighters being delivered from Chance Vought Aircraft at Dallas. Man-from-Mars photo below shows CV Test Pilot Jack Walton in a partial pressure suit atop the twin-jet fuselage of a Cutlass. Flight refueling above shows a Cutlass filling its tanks from a Navy AJ-2 tanker.
—(Chance Vought Photos.)

ment, can also carry guided missiles.

Recent tests demonstrated the feasibility of mid-air refueling of the Cutlass. A Navy AJ-2 tanker was used in tests at Dallas, with a Cutlass repeatedly filling its large fuel tanks in flight. The system used was produced by Flight Refueling, Inc., of Baltimore, Md. ★ ★ ★

Cutlass On Active Duty

WITH Chance Vought F7U-3 Cutlass twin-jet fighters now being delivered to the fleet, the radical tailless craft will become more widely known. Meanwhile, the Navy and Chance Vought Aircraft at Dallas have released more interesting details on the Cutlass.

The F7U-3 has become the first U. S. fighter to carry 2.75-in. Mighty Mouse air-to-air rockets in packs or containers mounted beneath the fuselage. It can also carry two conventional rocket pods on pylons beneath the wings. The rocket pack beneath the belly is not dropped after firing, as are wing pods, but is reloaded and used repeatedly.

The Navy says the Cutlass, which has 20-mm. cannon as standard arma-

Aircraft electronic experts from 19 authorized Narco DME service centers have been factory trained by Narco. Those in the first Narco course are shown above. Seated, left to right, are J. A. McKechnie, Reading Aviation; Bob Laub, Bohling Aircraft; John Wilson, Atlantic Aviation; Dub Everly, Matthews Electronics; A. R. Applegarth, Narco; Ted Bartley, Roscoe Turner Aero; Pat Miller and R. D. Anderson, Anderson Aircraft Radio; and J. R. Golden, Aerotron Radio Sales. Standing, left to right, are H. B. Kennedy, J. D. Reed Co.; J. L. Hemingway, CAA; Bill Etchison; Al Blodgett, Remmert-Werner; W. D. Rollick and J. R. Reagan, Piedmont Aviation; Wes Fielding, Bayaire Avionics; Carl Fox, Associated Radio; C. B. Shaw, Airborne Communications; Carl Schwarz, Anderson Aviation; Everett Kriese, Aviation Radio; George Matthews, Matthews Electronics, and R. K. Schaefer, CAA. Not shown are Eugene Ritchie, Santa Monica Aviation, and Jimmy Allen, Aircraft Electronics. —(Narco Photos.)

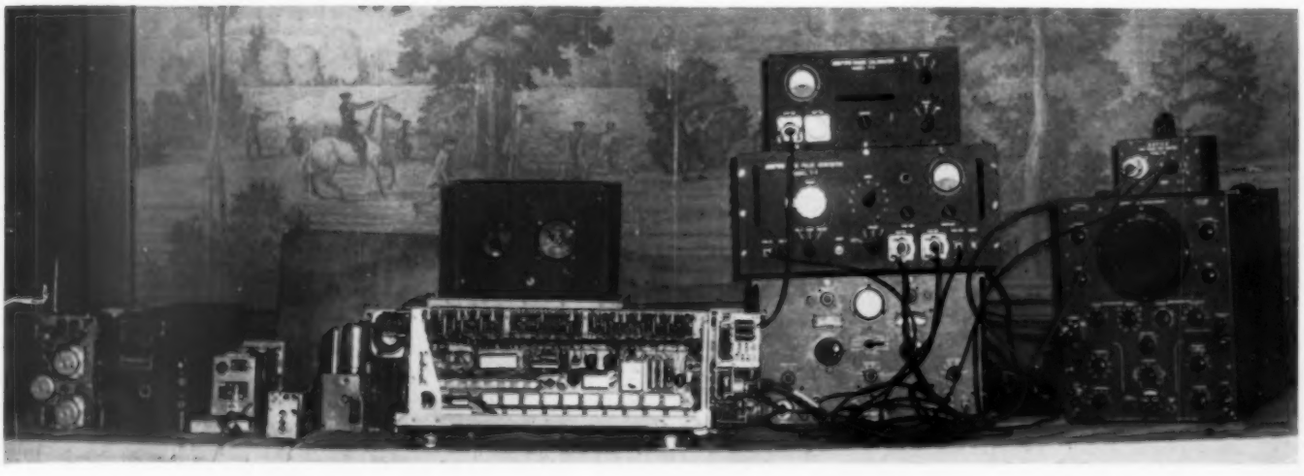
Break For The Customer

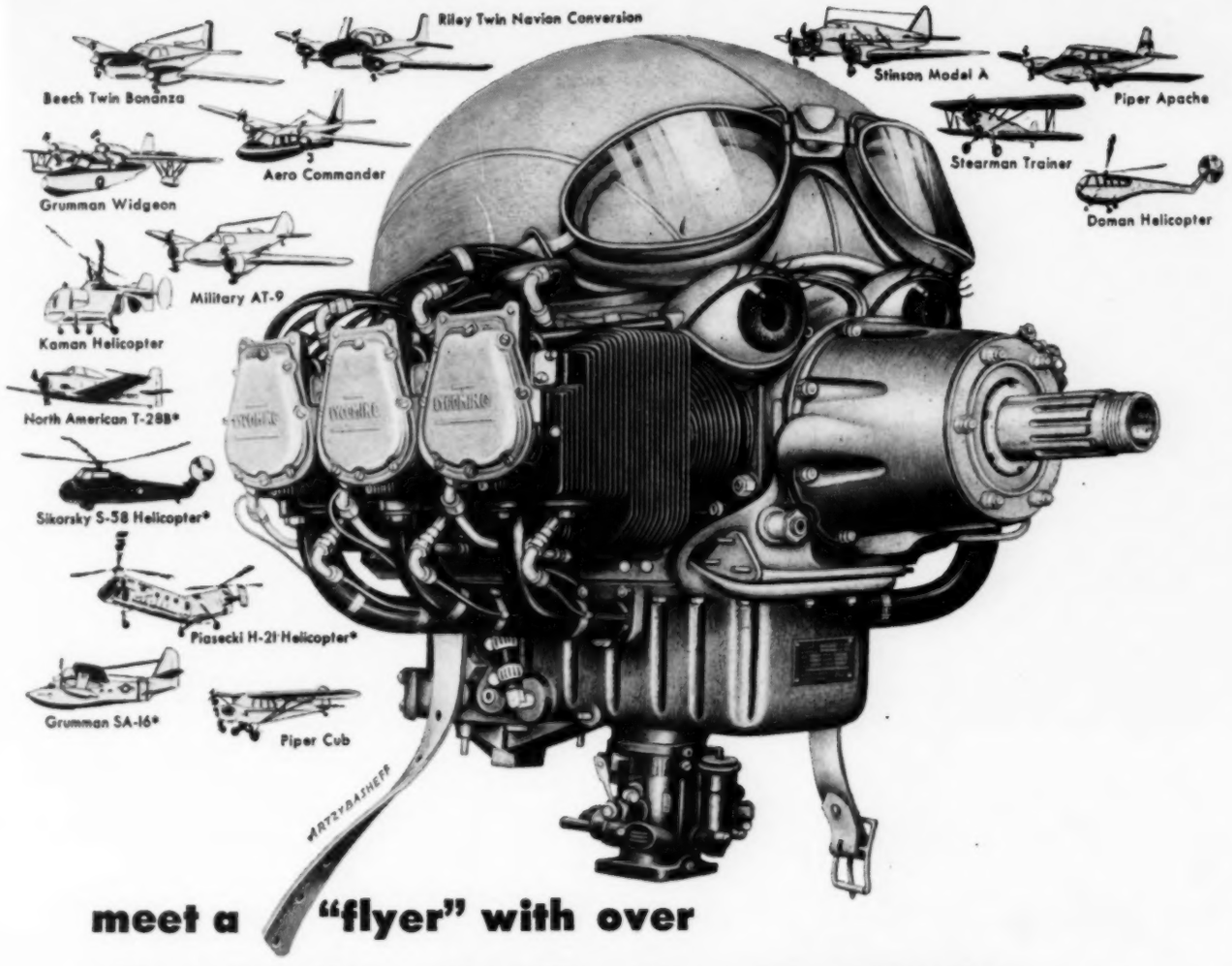
EXECUTIVE aircraft operators are getting their first Narco distance measuring equipment (DME) installations and indications are that the Narco equipment not only makes flying simpler and safer but is giving the purchaser definite advantages and protection in the form of quality both in the equipment and in its installation and servicing.

This happy combination is the result of comprehensive planning by National Aeronautical Corporation and its distributors and authorized service stations. While the Narco DME was being developed, Jim Riddle, president, and his sales manager, Gil Quinby, recognized that DME would not prove practical on a bargain-counter basis such as had been followed in its omni equipment program. DME would have to be a quality project with the emphasis on performance and dependability and with costs as secondary. This policy went farther than the perfection of the equipment itself on so-called "gold-plate" standards with crystal tuning, ruggedized tubes and the like. It guided establishment of a network of authorized service centers for Narco DME installations, calibration and maintenance. These have to meet strict factory requirements and standards.

(Continued on page 72)

Graduates of the Narco DME school received certificates from Jim Riddle, president of National Aeronautical Corp. Two are shown at left with Riddle. Top is Carl Fox of Associated Radio and bottom is George Matthews of Matthews Electronics. Some of the DME test equipment which each authorized Narco DME service center must possess is shown below. This represents an investment of $4,000 to $7,000. —(Narco Photo.)





meet a "flyer" with over

250,000,000

hours behind him!

"He's" a new Lycoming air-cooled engine. He's backed by Lycoming's experience in creating and producing 50,000 aircraft power plants . . . each with a flight-proved life expectancy of at least 5,000 hours.

You learn a lot about flying in 25 years . . . and 50,000 engines!

Our first Lycoming aircraft engines gained us invaluable experience flying for one of America's first scheduled air lines. Their successors have flown military missions in aircraft from liaison planes, to trainers, to helicopters. As "civilians," they now fly small single-engine utility planes, and leading twin-engine "flying offices" for businessmen.

Do *you* need this kind of dependable air-cooled power . . . or any of the diversified services listed above our signature? Lycoming's wealth of creative engineering ability . . . its 2½ million square feet of floor space . . . and 6,000-plus machine tools stand ready to serve you. *Whatever* your problem . . . *look to Lycoming!*

Aircraft Engines
Industrial and Tank Engines
Engine Overhaul
Generating Units

Turbine Engineering and Research
Engineering Design and Development
Hardened and Ground Precision Parts
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Complete Assemblies
Heat-Treating and Plating
Steel Fabrication
Castings
Boilers

ENGINEERS WANTED:
Long-term U.S. Air Force contracts for gas-turbine power plants provide unlimited opportunities for top-flight experienced engineers. Openings in radial engine development for stress, analytical and project engineers. Write Vice-President, Industrial Relations, Stratford, Conn.

FOR RESEARCH • FOR PRECISION PRODUCTION

LOOK TO **Lycoming**

DIVISION OF AVCO STRATFORD, CONN.
Manufacturing plants in Stratford, Conn., and Williamsport, Pa.

*Wright-Cyclone engine, built by Lycoming under license from Curtiss-Wright Corporation, Wright Aeronautical Division.

Always Ready To Go

Hundreds of Cessna owners all over the country depend on the Authorized Cessna Service Stations listed below for their transportation needs—Authorized Cessna Service is their assurance that business planes are always ready to go, always in top condition for reliability, performance and comfort.

Every Cessna owner is guaranteed three important things by our factory-supervised Cessna Flat Rate Service:

(1) You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all maintenance needs.

(2) You get genuine Cessna parts and factory-trained workmanship.

(3) You save money and time and we stand behind every job for your fullest satisfaction.

To make the most of your Cessna's usefulness, visit the Authorized Cessna Service Stations listed below.

These progressive Cessna Authorized Service Shops offer flat-rate service.

Aircraft Sales Company
Meacham Field
Fort Worth, Texas

Aviation, Inc.
Municipal Airport
Tulsa, Oklahoma

Champ's Flying Service
Municipal Airport
El Paso, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
Municipal Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Howard Aero Service, Inc.
San Antonio International Airport
San Antonio, Texas

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Southwestern Skyways, Inc.
New Municipal Airport
Santa Fe, New Mexico

Kenneth Starnes Aviation Service
Adams Field; Little Rock, Arkansas

West Texas Flying Service
Midland Airport
Midland, Texas

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

MORE AIRPLANE-AT YOUR PRICE

All-Metal—4-Place—Now

ONLY $8295

More Than Ever, Your Best Buy in the Low-Price Field!

Here it is! America's *only* 4-place, all-metal airplane in the low-price field—the beautiful 1954 Cessna 170. Eleven all-new features. Cruises at over 120 m.p.h.! Smooth, quiet 6-cylinder engine is highest-powered in low-price field. Smart new interior and exterior colors and trim. More airplane than ever . . . yet the price has been *lowered* to $8295!

Cessna 170 AIRCRAFT COMPANY

Ageless All-Metal

Cessna 170 is the only airplane in the low-price field that offers you the strength and safety of all-metal construction. Stays beautiful for years, requires no maintenance.

Only Cessna 170 Offers You These "Extra Value" Features in the Low-Price Field

"PARA-LIFT" FLAPS for short, slow landings, quick take-offs.

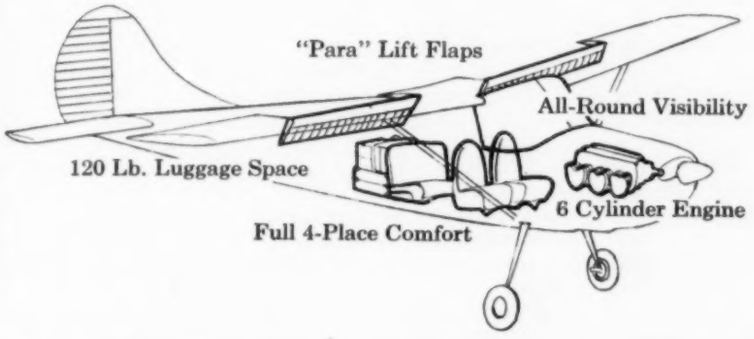
FULL 4-PLACE COMFORT with 120 lbs. luggage—or—2-place with a quarter ton of cargo.

BEST ALL-ROUND VISIBILITY . . . both over-the-nose and in flight. Compare it with any other airplane!

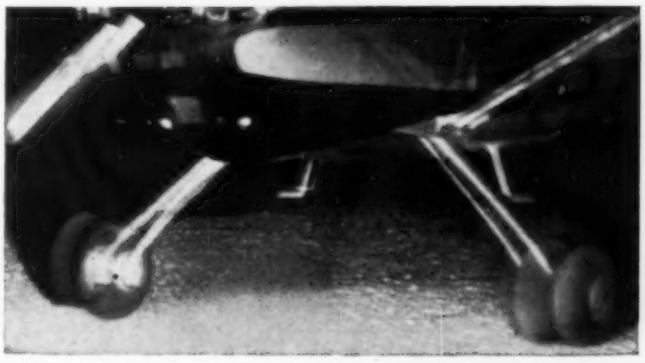
BEST HEAT and VENTILATION. Fresh warm air or fresh cool air to every passenger. Living room comfort at all altitudes, in all seasons!

6-CYLINDER ENGINE, more cylinders than any other airplane engine in the 170 price range!

ALSO: Flush-riveted wing struts . . . windshield defroster . . . easier-to-use trim tab wheel . . . improved instrument panel . . . foam-rubber seats . . . two yard-wide cabin doors.



World's Safest, Smoothest Landing Gear



It "Flexes" To Absorb Shock

Superimposed high-speed photographs show how Cessna's exclusive landing gear flexes upward and outward to absorb the shock of rough-field landings and take-offs, provides a smoother ride for passengers, reduces strain on all parts of the airplane. No maintenance is required because there are no moving parts to wear out. For more information on Cessna airplanes, see nearest Cessna dealer (listed in yellow pages of telephone book) or write Cessna Aircraft Co., Dept. F-7, Wichita, Kansas.

NARCO DME

(Continued from page 68)

First requirement for Narco DME service centers was factory training of their technicians. A special course was arranged, with emphasis on the use of proper test equipment. This equipment was produced for the service centers, each of which now has from $4,000 to $7,000 invested in special equipment for Narco DME installations and servicing.

The importance of this preparation is found in the factory warranty behind each DME sale. Authorized Narco service centers apply a lead seal to "lock" each DME installation. Without one of these coded and unbroken seals, an installation carries no warranty. But with an authorized seal, the installation is guaranteed for 90 days without a reservation. If it mal-functions during the 90-day period, it will be repaired or replaced at any authorized Narco service center in the country without charge. Such a warranty can mean only one thing — fullest confidence by both the factory and the service center in the equipment and in its proper installation.

Being priced at $4,995 for the equipment, which has an installed weight of about 30 lbs. and for which installation costs are running $250 to $300 depending on individual structure's requirements, the equipment obviously should be backed by the fullest possible warranty. Narco officials realized this three years ago when their DME development began. But making such a warranty possible was something else, as is standing behind it from the outset of the new equipment's introduction.

There are 19 authorized Narco DME service centers. Pilots can purchase the equipment from them or from Narco distributors, such as Air Associates. But only the 19 authorized service centers can calibrate the equipment, check out its installation with a coded seal, and complete the warranty papers. Basic in the DME service program is a policy of "remove and replace." This is possible by design of the equipment. It is unitized, having five elements which can be unplugged from each other for inspection, replacement or servicing. Authorized service centers stock parts and exchange units.

Executive aircraft owners began installing the Narco DME as soon as it became available last month. An example is furnished by Carl Fox of Associated Radio in Dallas, which is an authorized Narco DME service center. He had 6 orders awaiting delivery. No. 1 installation went in an Air Associates' Bonanza based in Dallas. No. 2 went in an S. W. Richardson DC-3. No. 3 DME was installed in a Riley Twin owned by Don Parker of Amarillo. Associated's fourth DME installation went in another S. W. Richardson DC-3. Numbers 5 and 6 were to be completed early in June, being for George Pew's Aero Commander from Oklahoma City and Frontier Chemical's Lodestar at Dallas.

★ ★ ★

Airmen's Calendar

June 19—Annual Order of the White Heron Fish Fry, Anahuac, Texas.

June 20-23—ADMA Mid-Year Meeting, Stanley Hotel, Estes Park, Colorado.

June 21-24—IAS Annual Summer Meeting, Los Angeles.

June 24-26—10th Annual Forum, American Helicopter Society, Washington, D. C.

July 3-6—8th Annual All-Woman Transcontinental Air Race, Long Beach to Knoxville. Sponsored by Ninety-Nines, Inc.

July 20-Aug. 4—World Soaring Championship, Great Hucklow, England.

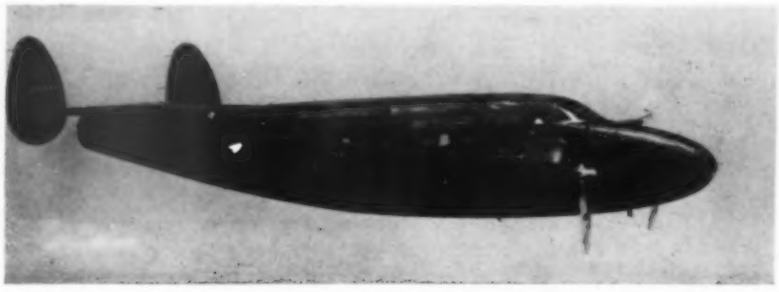
July 27-Aug. 5—21st National Soaring Contest, Elsinore, Calif.

Aug. 7-8—2nd Annual Experimental Aircraft Association Fly-In and 4th Annual National Air Pageant, Milwaukee, Wisc.

Aug. 8—Montana Pilots Association Free Trout Breakfast, Livingston, Montana.

Sept. 4-6—National Aircraft Show, Dayton, Ohio.

Sept. 19-21—18th International Northwest Aviation Convention, Hotel Vancouver, Vancouver, B. C.



In this Learstar flight view, note new nacelle, windshield, empennage fairing eliminating distinctive Lodestar hump, retracted tailwheel and clipped stabilizer tips. Not visible is enclosed main gear well.

Production Learstar Flying

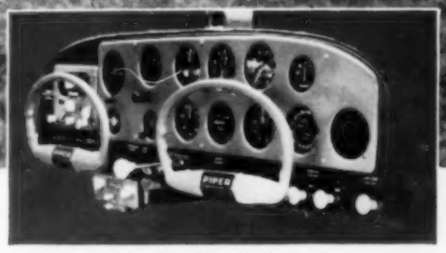
FLIGHT tests for certification have been made by the No. 1 Production Learstar, a custom conversion of the Lockheed Lodestar with many ingenious drag-reduction and high-performance features. Arthur W. Cruse, general manager of the Lear Aircraft Service Division at Santa Monica, Calif., says the firm has orders for Learstars from several domestic and foreign corporate aircraft owners.

The Learstar is offered as having a normal cruising speed of about 300 mph. Gordon Israel, well known racing plane and jet fighter designer, who is chief engineer on the Learstar project, reports that flight tests indicate the airplane's projected performance figures in all catagories will be equalled or bettered. Performance will not be announced until complete data has been accumulated in flight tests for CAA certification as a new-type transport.

Test Pilot Les Coan commented after the initial flights on the Learstar's outstanding climb performance. "I have flown a good many other 'bullets' but I never before felt such tremendous acceleration as I found in this one," Coan said. "In one climb test, at 21,000-lb. gross weight, we went from a standing start at sea level to 10,000 ft. in only 5 mins. 51 secs."

New are Wright 1,425-hp. C9HD engines, nacelles with full-closure main gear wheel-well doors and aerodynamic panorama windshield. Also in the new nacelles are larger shock mounts, new exhaust augmentor stacks, quick-removable ring cowls with cowl flaps, and stainless steel diaphragms and firewalls. The new engine mounts move thrust lines 3 inches outboard and can carry any Wright 1820 series engines up to and including the 1,525 hp. C9HE.

Features include new wing tips and leading edges, modified flap system and wing trailing edges, outer panel fuel tanks totaling 480-gal. additional fuel capacity, flush windows, new empennage fairing inside which are ADF and omni antennas, clipped stabilizer tips, retractable tail wheel, new electrical system, new dual hydraulic system, new type wheels with spot-type breaks, 100,000-BTU combustion heating system with new ventilation and drag-free intake and blower, new cockpit and new floor.



BUILT FOR CROSS-COUNTRY Fully-equipped Piper Super Custom costs less than most 4-place ships bare. Includes full gyro instrumentation, Omni, VHF transmitter, VHF/LF receiver, loop.

BUILT FOR PERFORMANCE Over 120 mph at better than 15 miles per gallon. The Tri-Pacer's a really useful airplane for the businessman who knows, if it's business he's after, he can go after it best by Tri-Pacer.

BUILT FOR COMFORT Foam rubber cushions assure restful riding hour after hour. Individual ventilators keep cabin cool in summer; double heaters assure warmth in coldest weather.

Piper Tri-Pacer

One thing's for sure—when you fly the Tri-Pacer you fly with confidence for you know it's *built*, really well built, really well designed. Its bridge-like fuselage, welded of high quality aircraft steel and its wings made up of aluminum spars and ribs secured by four husky lift struts, assure you of a rugged lightweight compact structure.

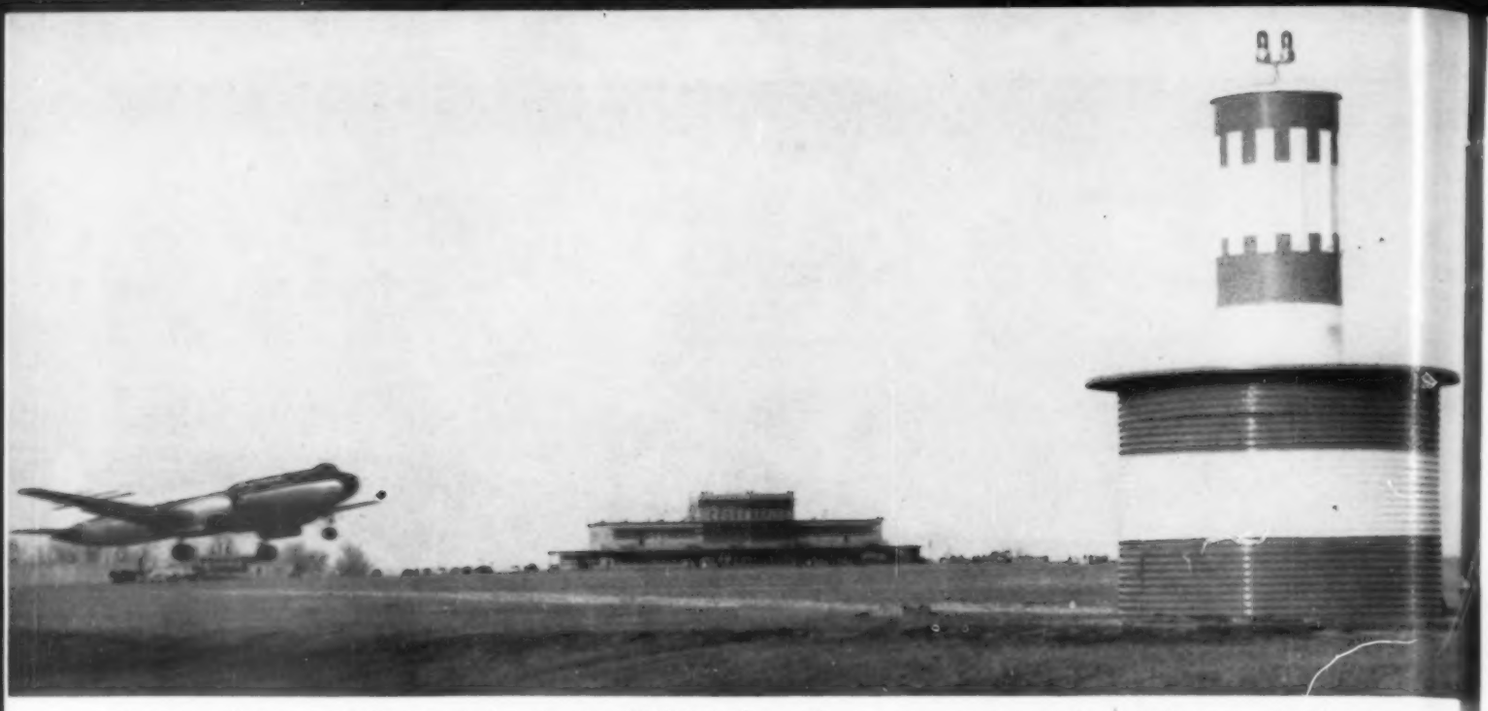
And over all is the exclusive Piper Duraclad finish, the tough plastic surface that is resilient, non-flammable, sun and weather-resistant and lasts much longer than coverings previously used. Duraclad's smooth finish means added speed and easier cleaning; comes in a choice of attractive colors.

This type of construction provides maximum strength with minimum weight which explains why the Tri-Pacer carries such a hefty load. Just another reason why more people pick Piper Tri-Pacers than any other four-place plane.

See and fly the Tri-Pacer at your Piper dealers or SEND TODAY for handsome, full-color brochure on this great airplane. Dept. 6-F.

PIPER AIRCRAFT CORP.

Lock Haven • Pennsylvania



Airport installation of a Collins terminal omni system (TVOR) is shown above, as operated at Cedar Rapids, Iowa. Cylinder atop housing contains rotating antenna. Complete package units are priced from less than $10,000 to less than $18,000 and are available to city, county, state or private airports. They make possible accurate low approaches to the airport in bad weather.
—(Collins Photo.)

Low-Cost Collins Airport Omni

Municipal and private airports can now install their own facilities for low approaches

LOW-COST, packaged VOR omni installations are now being offered for airports and air strips — city, county, state, commercial or private — by Collins Radio Company. Complete costs for such facilities range from less than $10,000 to less than $18,000.

The first Collins VOR ground system purchased for a municipal airport is at Santa Monica, California. The first Collins airport omni in operation was installed at Cedar Rapids, Iowa, and operated by Collins as a prototype project in its development of its new VOR systems for airport installation. Sales to foreign governments are now being negotiated.

While the Federal Airways System has installed and is operating hundreds of VOR ranges throughout the nation, these are for the purpose of providing medium-range enroute navigation service. CAA omni stations are located along the airways. Following their commissioning and growing use in navigation, there has developed the need of locating other VOR ground stations on the airports themselves as well as along the airways, the airport installation to provide a locator station lending itself to the use of low approach procedures as well as homing to off-airways destinations. The new Collins low-cost omni package system is intended to meet this need.

A Collins VOR installation near the center of an airport, known as a TVOR or "terminal omni," makes possible low approaches from any one of a large number of possible approach directions. It also provides increased accuracy by always using navigation based on convergence on a station rather than divergence as sometimes necessary when using low frequency facilities for approaches.

This is Collins Radio's new rotating dipole antenna with the cover removed. Rotary components include motor, a tone wheel and rotating fixed condensers. The rotating dipole is mounted in the center of 12 slots of a cylinder atop the Collins installation (photo above).
—(Collins Photo.)

The new Collins ground-based VOR systems are available as complete packaged units for both single and dual transmitter installation as well as low and high-powered versions. The 50-watt single installation, Type OR-101, is priced at less than $10,000. The 50-watt dual OR-201 with automatic switchover is priced at less than $15,000. The 200-watt single OR-301 is priced at less than $11,000 and the dual 200-watt OR-401 with automatic switching is less than $18,000. The airways VOR transmitters, usually spaced about 100 miles apart, are generally of 200-watt power and omni installations for airports are usually equipped for 50-watt signals.

All of the combinations offered by Collins are contained in uniformly-

(Continued on page 87)

Both at work and at play — you'll enjoy life more with a **BEECHCRAFT**

No one can buy an extra minute of time, at any price; but you can *save* time from normally uninteresting activities, such as time-consuming transportation from place to place. And the time saved can be spent on the things you want to do most. Your family can enjoy more of your company. Your pet charitable activity can profit from more of your attention — your business can be run more efficiently — or you can even save a little time for relaxation and your favorite recreation.

For more profit and more pleasure, let the J. D. Reed Company show you how a new Beechcraft can help you enjoy life!

Above: The 175-to-184 mph new 1954 Beechcraft Bonanza now ready for your inspection at The J. D. Reed Company.

Below: Miss Suzanne Beech, Wichita, Kansas, astride her "Lady Bonanza," one of her entries in the 1954 Annual Pin Oak Horse Show in Houston.

J. D. REED CO., Inc.
SALES SERVICE
Beechcraft
DISTRIBUTOR
MUNICIPAL AIRPORT
HOUSTON, TEXAS

Owning a Beechcraft is a paying proposition. We invite you to let the J. D. Reed Company prove it with facts, figures and a demonstration. A phone call or letter on your company letterhead will bring complete details.

Qualified Service makes the FINEST *product* FINER

You can put your confidence in...

Certified Beechcraft Service

The Beechcraft owner can well take pride in the fact that he owns and flies one of the finest products of the Aviation Industry. He also has at his disposal the finest national service organization that is qualified by the Beechcraft factory to maintain all Beechcraft models in factory new condition.

At Certified Beechcraft Service Stations you will find skilled and efficient Beechcraft factory trained personnel, adequate equipment and facilities, factory authorized parts and accessories plus economical prices. Certified Beechcraft Service is an additional bonus you receive when you purchase a Beechcraft.

AIRCRAFTCO, INC.
New Municipal Airport
Wichita, Kansas

AIRCRAFTSMEN, INC.
Will Rogers Field
Oklahoma City, Oklahoma

ALAMO AVIATION, INC.
Municipal Airport
San Antonio, Texas

ANDERSON AIR ACTIVITIES
General Mitchell Field, Milwaukee, Wisc.
Truax Field, Madison, Wisc.

ATLANTIC AVIATON CORP.
Teterboro Airport, (25 minutes from Times Square)
Teterboro, New Jersey
Logan Airport, East Boston, Mass.

ATLANTIC AVIATION SERVICE
New Castle County Airport, Wilmington, Delaware

BUTLER CO., AVIATION DIVISON
Municipal Airport, Chicago, Ill.

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport, Shreveport, La.

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport, Albuquerque, New Mexico

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Mgr.
Love Field, Dallas, Texas

HUNTER FLYING SERVICE, INC.
Hunter Field, Cedar Rapids, Iowa

ROD MORE AVIATION SERVICES
Cuddihy Field, P. O. Box 556,
Corpus Christi, Texas

OHIO AVIATION COMPANY
Dayton Municipal Airport, Vandalia, Ohio

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind.

J. D. REED CO., INC.
Municipal Airport, Houston, Texas

TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 5, Municipal Airport, Tulsa, Oklahoma

WINGS, INCORPORATED
Wings Field, Ambler, Pennsylvania
Philadelphia International Airport, Philadelphia, Pa.

To obtain the best service for your Beechcraft visit the Certified Beechcraft Service Stations listed.

Get things going... keep things moving...

On-the-spot consultation may spell the difference between bonus or penalty. Men with the right answers can reach hard-to-get-to locations with a BEECHCRAFT.

Oftentimes it's possible to land your company BEECHCRAFT at the scene of activity, or certainly within minutes of the important spot. Furthermore you arrive rested and refreshed, ready for important decisions, with no worry about making return reservations.

Thousands of BEECHCRAFT owners daily are cutting their travel time as much as 75 per cent. If you are "pressed for time," ask a BEECHCRAFT distributor or dealer to show you the answers. Or write, on your company letterhead, to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

AIR REPORT

(Continued from page 5)

BERS were told in Dallas last month by Rufe Amis, president of Aero Design & Engineering Co., which produces Aero Commanders, that it would cost $15,000,000 to design and tool a 300-mph., pressurized executive transport meeting NBAA specifications and "ideals." Amis said such a development is not now economically feasible but that the NBAA specs call for a plane similar to the Convair 340 which is already in production and is available at a price approaching $800,000. Amis said it cost over $3,000,000 to roll out the first production-model Aero Commander and that Beech Aircraft invested between $3.5 and $4 million to put the Twin-Bonanza on the market, while Cessna invested about $2.5 million in developing and tooling its new Model 310.

FIVE MANUFACTURERS DELIVERED 319 NEW LIGHTPLANES IN APRIL, valued at $3,727,000 and bringing to 1,071 the total number of deliveries for the first 4 months of 1954, with total billings of $13,116,000. The tabulation by the Aircraft Industries Association's utility airplane council gave January-April delivery totals for the five companies as follows: Aero Design, 22 Aero Commanders; Beech, 175 units including 95 Bonanzas, 14 D18S twins, 26 Twin-Bonanzas and 40 Model 45 twins; Cessna, 460 units including 231 Model 180's, 210 Model 170's and 19 Model 195's; Piper, 405 units including 285 Tri-Pacers and Pacers, 119 Super Cubs and 1 Apache; Taylorcraft, 9 units including 8 Tourists and 1 Sportsman.

CANADIAN PRODUCTION OF HELIO COURIERS has been arranged between Fleet Manufacturing, Ltd., Fort Erie, Ontario, and Helio Aircraft Corp., Boston, Mass. Fleet is producing parts for Helio now.

PRODUCTION TOOLING FOR THE J69 GAS TURBINE AND MANUFACTURE OF 5 PRODUCTION ENGINES on a new Air Force contract have been announced by C. J. (Jack) Reese, president of Continental Aviation & Engineering Corp. The J69 is the power plant for the Cessna T37 light jet trainer for the Air Force.

BEECH AIRCRAFT HAS RETURNED TO 40-HOUR WORK WEEK schedules at all of its facilities. These plants have been operating on a 43.5-hour work week since June 1, 1953.

HILLER HELICOPTERS HAS REDUCED THE PRICE OF ITS 3-PLACE MODEL 12-B HELICOPTER from $36,000 to $33,400, explaining that the lower-priced model will be lighter in weight as a result of omission of accessory items. Additional accessories are available at prices previously published. Hiller also announced last month delivery of six Model 12-B helicopters to commercial customers.

BEST CONVENTION IN TEXAS PRIVATE FLIERS ASSOCIATION HISTORY was held last month at Galveston, with 120 planes flying in for the fun sessions and over 300 persons at the annual banquet. The group re-elected M. C. Martin, Dallas, president; Don Mitchell, Mineral Wells, vice president; Herman Barrow, Electra, second vice president, and Mary Helen Miles, Liberty, treasurer, and elected Charles Floyd, Denton, as secretary. Next TPFA flight will be on June 19 to Anahuac for the annual fish-fry of the Order of the White Heron.

NEWEST EXECUTIVE AIRCRAFT SERVICING FACILITIES AT CHICAGO MIDWAY AIRPORT have been formally opened by National Aero Service, Inc., and affiliated companies. With well-known O. B. Callan, former Beech Aircraft sales manager, as vice president and general manager, Aero Service has gone all-out for transient business and its elaborate new facilities include three new fuel trucks, new station wagons, new tugs, Jeep with mobile power trailers for de-icing, cleaning, heating and cooling, "fanciest" customer lounge in the country, and a BOQ for pilots. The 24-hr. service station is especially equipped for large aircraft. Affiliated with the service firm is National Aero Sales Corp., distributor for Aero Commanders, and Bohling Aircraft Corp., specializing in Aero Commander parts and service, aircraft radio, instrument and accessory service and overhaul, and component exchange service and maintenance.

RECORD NEW YORK-HONOLULU FLIGHT BY UNITED AIRLINES DC-7 was flown last month with a stop at San Francisco. Time for dawn-to-dusk trip was only 15 hrs. 49 mins. UAL Flight Engineering Manager Dusty Rhodes reported that a Sperry A-12 autopilot was in use 90 per cent of the time on the trip and that its operation was perfect. Star crew of the DC-7 included I. E. Sommermeyer, UAL's general manager of flight operations and W. E. Larned, manager of flight operations at Los Angeles.

NEW WORLD'S NON-STOP, NON-REFUELING RECORD OF 200.2 HOURS ALOFT was established last month by a 342-ft. Navy Goodyear ZPG-2 blimp. On the flight, the blimp flew leisurely from Lakehurst, N. J., to Key West, Fla., via Bermuda, the Bahamas, Puerto Rico and Cuba, demonstrating its ability to remain "on

Flight Proficiency Service for Pilots

AIRLINE-TYPE proficiency training is being conducted for business pilots at several points around the country. The four executive pilots above were pictured in Dallas where a new firm, Flight Proficiency Service, has started operations. Tex Barry (second from left) formerly with Pan American Airways and other airlines, heads the service. His first customers were (left to right) G. C. (Chappy) Lennox, pilot for the British American Oil Producing Co. Lodestar at Dallas, and Eddie Hart, co-pilot, and Gene Maroscheck, pilot, for the LeCuno Oil Co., of Marshall, Tex.

Lennox, with 16,000 hrs. of flying to his credit, said the airlines had demonstrated the values of proficiency training and that he learned more from a brief course with Barry than he had learned in years. Maroscheck has been flying a Beech D18S Twin but recently acquired a Lodestar. He said Barry's course taught him more about the Lodestar than he had learned about the Beech in years of flying it. Barry not only emphasizes transport techniques and procedures in the air but supplements it with Link problems.

Special tools and equipment

Advanced technical know-how

ALAMO AVIATION

As one of the nation's major overhaul and repair terminals, ALAMO AVIATION is constantly developing new techniques, new equipment and new processes that result in a better job in less time and at less cost. Our technical staff has pioneered many methods — as well as special tools and equipment — that have now become standard throughout the industry.

When you are considering a 100-hour check or a major overhaul— consult with us and let our engineering staff show you how you will benefit through the advanced technical know-how *available at ALAMO AVIATION.*

ALAMO AVIATION, INC.

Municipal Airport **San Antonio, Texas**

BEECHCRAFT DISTRIBUTOR

station" under service conditions. With a crew of 13, the blimp was powered by two 800-hp. Wright Cyclone 7 engines and Curtiss electric "zep-prop" propellers having 16-ft. 7-in. diameter. Special gearing allows both props to be driven by both or either engine. The ZPG-2 has a capacity of 975,000 cu. ft. of helium.

REDUCTION OF MAN HOURS IN CONVAIR B-36 PRODUCTION from 350,000 per copy to 142,000 has been reported, with a 15-per cent cost reduction despite rising labor and material costs. August Esenwein, Convair vice president, said his Ft. Worth plant has processed so many changes that the first and last B-36 have only 20 per cent common parts. Even so, he said Convair delivered every B-36 on schedule during the last two and a half years.

ALCOA HAS BEGUN OPERATION OF THE WORLD'S LARGEST PRESS for extrusion of giant aircraft parts at Lafayette, Indiana. The 14,000-ton press was purchased by the U. S. from a firm in Germany, which had almost completed it when Germany was defeated. Alcoa re-designed it to U. S. standards. A sister press of the same German size was taken by Russia and moved behind the iron curtain.

NEW PRESIDENT OF McCAULEY INDUSTRIAL CORPORATION, manufacturers of aircraft propellers at Dayton, Ohio, is E. G. Ackerman of New York. John F. Haines is vice president and chief engineer and Charles J. Schaefer is secretary-treasurer, with Walter Voisard handling sales engineering and service as field engineer. Henry Eastman, former president, and Sid Gamsu, former general manager, resigned recently. McCauley has produced over 40,000 Met-L-Props since 1946.

NEW AND COMPLETE AIRCRAFT REDECORATING SERVICE is being operated at Ft. Worth by Horton & Horton Custom Works, which moved from Houston to Meacham Field earlier this year. The firm, branch of an organization which is active in industrial furniture upholstering, redecorated 89 twin-engine aircraft during the last 12 months. It recently installed a new controlled-atmosphere paint spray room accommodating twin-engine aircraft. Electrically-heated, thermostatically-controlled pressure pots are used in spraying hot lacquer or enamel. B. L. Horton is president and general manager and Dorothe Anne Martindell, well known in aviation, directs sales and promotion.

OVER 200 AIRCRAFT OWNERS, OPERATORS AND ENGINEERS attended Pacific Airmotive's recent Pratt & Whitney engine operation and maintenance forum at Burbank.

CONGRESSIONAL AIRPORT in the Washington, D. C. area has been sold and will be converted to residential development.

CAA HAS GONE OUT OF THE TECHNICAL FILM LENDING BUSINESS, turning over its films to the University of Illinois Visual Aids Service, Champaign, Illinois. The University makes them available for postal charges only and inquiries should be addressed to it and not to CAA.

SIMMONDS AEROCESSORIES, INC., of Tarrytown, N. Y., is offering three new and versatile test units for checking and servicing all types of aircraft capacitance fuel gauge systems. Portable and self-contained in a carrying case, they are a line maintenance unit, a capacitance standards kit and test unit for measuring the dielectric constant of aircraft fuels.

BIGGEST ALL-HELICOPTER EXPOSITION EVER STAGED is lined up for the American Helicopter Society's 10th annual forum in Washington, D. C., on June 24-26. Thirty-eight booths of displays will be in the Mayflower Hotel, with a helicopter air show at the Old Polo Grounds.

BETTER CUSTOMER SERVICE is the goal of two new departments and readjustment of a third in the sales division of Goodyear Aircraft Corp. H. Webster Crum, sales manager, said field sales offices have been established at Dayton (H. H. McIntosh) and Detroit (G. H. Bancroft). Field representatives are also located at New York, Wichita, Dallas, Seattle, Los Angeles and Akron.

FIRST INTERCITY SCHEDULED AIRLINE HELICOPTER SERVICE begins in June when Mohawk Airlines, a local carrier, begins operating a new 8-passenger Sikorsky S-55 between Newark and Liberty-Monticello, N. Y. Dallas Airmotive in Dallas, Tex., which overhauls Wright 1820-202 engines used in Mohawk's DC-3's and engines for many other airlines, has contracted for overhaul of the Sikorsky's R-1340-40 engine every 600 hrs.

DELTA-C & S AIR LINES IS CELEBRATING ITS 25TH ANNIVERSARY of passenger service. Its first passenger flight was with a 6-passenger, 90-mph. Travelaire high-wing monoplane connecting Dallas, Shreveport, Monroe and Jackson on a 389-mi. route. The carrier has since flown almost 8,000,000 passengers and has extended its route to cover a 9,508-mile system serving 55 cities, 16 states and 7 countries. Delta's fleet consists of 15 DC-3's, 20 Convair 340's, 3 Constellations, 7 DC-6's, 4 DC-7's and 3 C-47 cargo ships. C. E. Woolman, president and general manager, has guided the airline since the beginning.

AFTER MORE THAN 30,000 HOURS AND 37 YEARS OF FLYING, Norvel O. Carmichael is retiring as a Pan American Airways captain and is living on a farm near Brownsville, Tex. He will be 60 on June 27. Carmichael won his wings in 191[illegible] at San Antonio with the Signal Corps and began flying with Pan American in 1932 between Brownsville and Mexico City, having flown previously for the Old Mexican Air Lines in 1927.

DAL-TEX AVIATION AT DALLAS reports it has been named No. 1 Cessna dealership in sale of new airplanes during 1954, according to Webb Thomas, sales manager. His sales were 8 new Cessnas with billings of more than $150,000 for the period. The firm is a dealer for Aircraft Sales of Ft. Worth, Cessna distributor.

NEW NAME FOR THE MEXICO CITY BEECHCRAFT DISTRIBUTORSHIP is Aeromex, S. A. de C. V. The firm operates on Aeropuerto Central and has offices at Gante 12, Mexico 1, D. F. F. J. (Pancho) Waltz, widely known in the States, is vice president and general manager. Mauricio de la Lama is president and Victor de la Lama is vice president. In addition to Beechcraft sales and service, Aeromex handles sales and service for Bell Aircraft, Lycoming, Hartzell, Lear and ARC.

ELLIOTT DALAND, designer of the famous Huff-Daland duster in 1920 and other airplanes including the Keystone bomber, during 37 years in the aviation industry, has resigned as vice president of Piasecki Helicopter Corp. but will continue as an advisor to the firm. He is now 68 years old.

A FLEET OF TWELVE MULTI-ENGINE AIR TRANSPORTS is used by General Motors in the nationwide showings of the corporation's 1954 Motorama. At its Los Angeles showing recently, GM had six Douglas DC-3's, five Lockheed Lodestars and a Lockheed Ventura parked at AiResearch. They brought in GM President Harlow Curtice and 19 other corporation executives.

THE SOUTH AMERICAN GOVERNMENT OF COLOMBIA has ordered 12 Piper PA-18 Tandem trainers. The 135-hp. Super Cubs will be used for government-subsidized civilian pilot training and are equipped with primary blind flying group.

TRIP TO SOUTH AMERICA IN A CESSNA 180 has been completed by Max Weinberg, flying attorney of Quincy, Ill. Weinberg sent cards to FLIGHT MAGAZINE along the way and on returning reported that his Cessna 180 performed perfectly throughout the flight. He has been making trips to Mexico and Central America every year for several years.

PIASECKI HELICOPTER CORPORATION was ready in late May to begin flight tests with a turbine-powered version of its huge YH-16A Transporter. It is equipped with Allison turbine engines. ★ ★ ★

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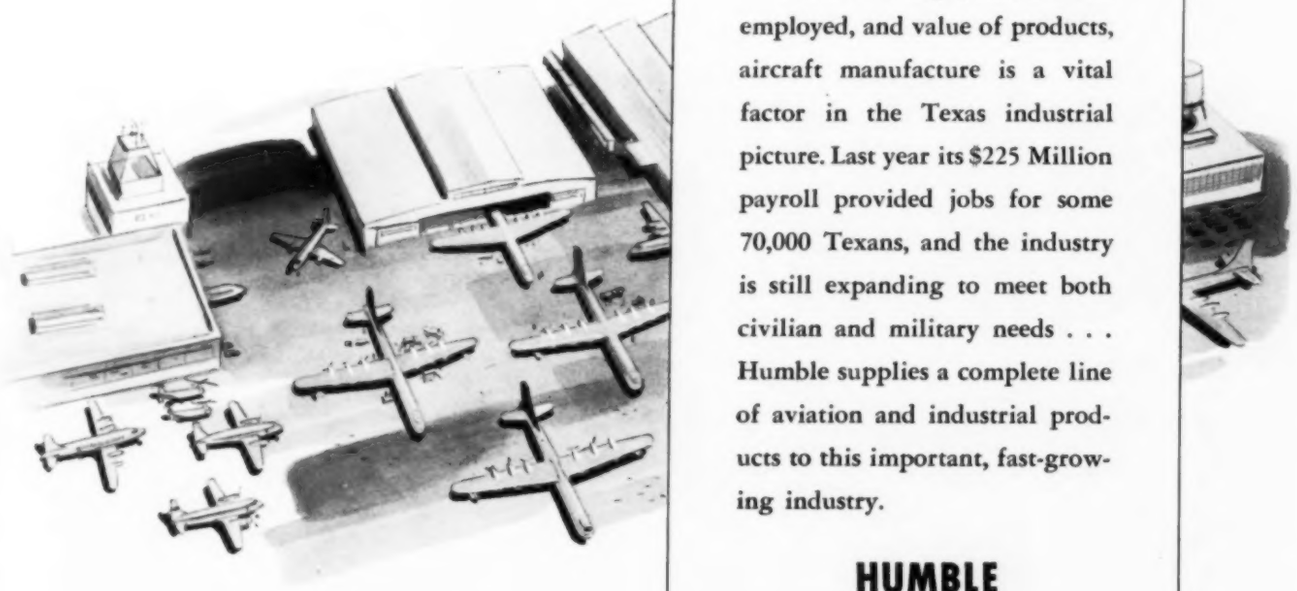
salutes Texas' fast-growing *Aircraft Industry*



IN TERMS of payroll, number employed, and value of products, aircraft manufacture is a vital factor in the Texas industrial picture. Last year its $225 Million payroll provided jobs for some 70,000 Texans, and the industry is still expanding to meet both civilian and military needs . . . Humble supplies a complete line of aviation and industrial products to this important, fast-growing industry.

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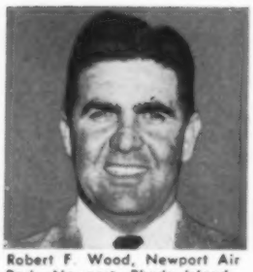
NATION-WIDE **SALES & SERVICE** ORGANIZATION

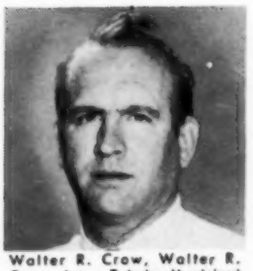
AERO DESIGN Commander 560

H. Leibee Wheeler, Buffalo Aeronautical Corporation, Buffalo Municipal Airport, Buffalo, New York.



Robert F. Wood, Newport Air Park, Newport, Rhode Island.

George Harte, Harte Flying Service Inc., Chanute Municipal Airport, Chanute, Kan.



Walter R. Crow, Walter R. Crow, Inc., Toledo Municipal Airport, Walbridge, Ohio.

B. G. Vandre, Van's Air Service, Municipal Airport, St Cloud Minnesota.

C. W. "Wayne" Crussell, Southern Aero, Inc., Municipal Airport, Atlanta, Georgia.

Cheston M. "Chet" Newhall, The Babb Co. (Canada) Ltd., Montreal Airport, Dorval, P.Q.

Art Maurer, Arthur Maurer Co., Inc., LaGuardia Field, New York, N. Y.

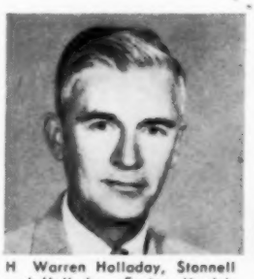
O. B. Callan, Sales Manager National Aero Sales Corp., Midway Airport, Chicago, Ill.

Don Hood, President, Air Sales & Service, Inc. Weir Cook Municipal Airport, Indianapolis, Indiana.

Peter Graves, Southern Ohio Aviation Company, Inc., Dayton Municipal Airport, Vandalia, Ohio.

Ray I. Wilson, Manager, Downtown Airpark, Inc., 1800 South Western, Oklahoma City, Oklahoma.

Don Vest, Vest Aircraft & Finance Co., P. O. Box 5306, Sky Ranch Airport, Denver, Colorado.



H Warren Holladay, Stonnell and Holladay, Easton Municipal Airport, Easton, Md

Don Pennington, Carolina Aero Company, Asheville-Henderson ville Airport, Fletcher, North Carolina

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AERO DESIGN AND ENGINEERING COMPANY

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★ greater performance
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AMERICA'S PREMIER AVIATION SHOW....

Again this year Dayton will provide the setting for the National Aircraft Show — America's Premier Aviation Show.

Scene of this outstanding event will be the sprawling J. M. Cox Dayton Municipal Airport at Vandalia. It will feature aerial exhibitions by the U. S. Armed Services and ground exhibits by the industry . . . including the staging of such traditional high-speed classics as the Thompson, Bendix, Allison, General Electric and like trophy events.

Spacious hangars will provide the vast indoor exhibit space for engines, instruments, accessories, equipment, parts, etc. The adjacent concrete aprons will be transformed into the country's largest outdoor showroom for personal, commercial and military aircraft.

This show has been accorded national acceptance by the aircraft industry. By tradition it is the nation's major aviation event and the common meeting place for its air-minded public and all components of private, commercial and military aviation.

Last year it witnessed one of the most thrilling and inspiring aerial presentations of our U. S. air might . . . and received the overwhelming support of major industrial exhibitors from coast to coast who utilized over 20,000 sq. ft. of indoor exhibit space.

The only major show approved for participation by the U. S. Department of Defense and the Armed Services. It merits your serious consideration.

For floor plan diagrams, exhibit space contracts, ticket information and complete details write—Benjamin T. Franklin, General Manager, **NATIONAL AIRCRAFT SHOW, 400 Union Commerce Bldg., Cleveland 14, Ohio.**

SPONSORED BY
AIR FOUNDATION and DAYTON CHAMBER of COMMERCE
SANCTIONED BY NATIONAL AERONAUTIC ASSOCIATION

AERO COMMANDER

(Continued from page 61)

Price of the new Model 560 is $69,500 as compared to $66,000 for the predecessor model, but the new price includes several items as standard which were formerly optional at extra cost.

The Model 560's 6-cylinder, geared engines are Lycoming Model G0-480-B power plants with a take-off rating of 270 hp. each and a continuous rating of 260 hp. each, as compared to 260 hp. for take-off and 240 hp. for continuous operation in the earlier Model 520. They are equipped with chrome-plated rings for longer service life.

A new front-engine cowling incorporates a newly-developed dual air induction system. It provides balanced air flow to the carburetor which not only improves fuel distribution and lowers cylinder temperatures but provides an alternate hot air source. A new oil cooler system receives air direct from the cowling grill and vents it beneath the cowling, making for greater efficiency in cooling and in the exhaust augmentor system, which is thus relieved of handling the volume of hot air from the oil radiator.

Also in the power plant section, a new type of high-speed generator is used and two generators, one for each engine, are now standard to provide a total of 100 amps in electrical power. The new generators are each 8 to 9 lbs. lighter in weight than those formerly used. They turn at 8,000 rpm. and are blast cooled. The engines have a new extended-type oil filler of large diameter for easier access and oil drainage is faciliated by addition of a hose extension and a quick-opening valve. Quick-opening fasteners provide com-

Low-to-ground nose-mounted landing lights eliminate glare. Center opening is air intake for cabin heater system. Cylinder on nose strut is power steering device and lines mark tow limits, with shorter turns provided in new model.
—(Aero Design Photo.)

plete cowl removal in less than 5 minutes.

New 3-bladed propellers have been developed for the Model 560 by Hartzell, which furnishes the all-metal, full-feathering propellers used on the airplane. These are of shorter diameter than the standard 2-blade props and are said to provide exceptional engine smoothness and more effective noise reduction.

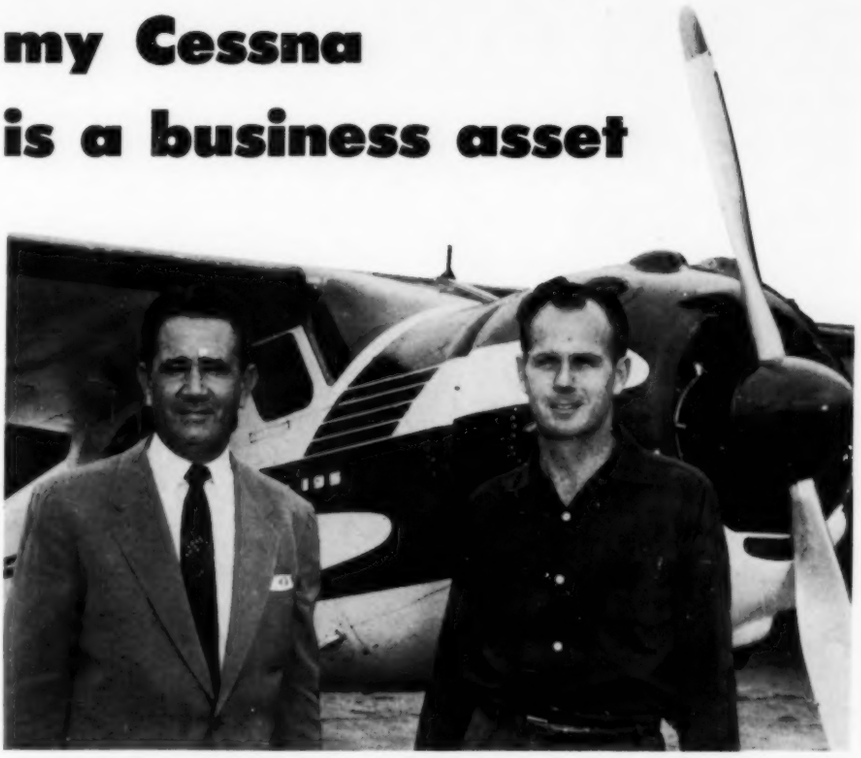
A new swept tail distinguishes the new model. It is incorporated in the Aero Commander's exceptionally-clean aerodynamic design for several reasons. Discussing this, the factory says sweepback extends the control areas farther rearward for a longer moment arm. This gives more stability to an already exceptionally stable airplane and makes for more effective control at low speeds and during flight with one engine inoperative. In sweeping the surfaces, the new design also adds some additional tail area in the vertical surfaces. Height of the fin from the ground is 14 ft. 9 ins. as compared to 14 ft. 5 ins. formerly.

An increased payload has been obtained with a new gross weight of 6,000 lbs. for the Model 560. This compares with a 5,500-lb. gross weight for the predecessor Model 520. Only about 100 lbs. of additional weight was involved in going to the new gross. Empty weight for the new model is 3,900 lbs., for a useful load of 2,100 lbs., as compared to a 1,700-lb. useful load for the old model.

The standard version includes in its empty weight such items as Hartzell all-metal feathering propellers, a full

All these bags and more are easily stored in the Aero Commander's 34-cu.-ft. baggage compartment, featuring knee-high loading. Passenger seats in cabin are quickly removable from Wedjit fasteners, which are used for tie-downs in carrying up to 2,000 lbs. of cargo with unobstructed floor.
—(Aero Design Photo.)

my Cessna is a business asset



JOE DIXON, LEFT, AND PILOT LES WORDEN AND CESSNA 195

says Joe Dixon, drilling contractor!

Joe Dixon, prominent Midland, Texas, drilling contractor with interests in Texas, Illinois and Mexico, reports, "We fly everywhere and have never found anything that beats our Cessna 195. We land anywhere — pastures, strips and country roads, and taxi right up to the rig. Our Cessna lets us keep up personal contact with all operations, saves time and money."

"Converted (equipped with the Jacobs R915-7 330 hp. engine) by West Texas Flying Service," says Pilot Les Worden, "the Cessna 195 gets twin-engine cruising speeds, flies at higher altitudes. High-wing stability and visibility, power reserve, autopilot, oxygen, 2-way radio, all make it easy on pilot and passengers."

What the Cessna is doing for Joe Dixon it can do for you. Stop in. Let us show you how the Cessna can be used to advantage in your business.

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set of blind flying instruments, a Lear LTRA-6 radio incorporating a VHF transmitter and receiver and a low-frequency receiver, dual generators, emergency exit, internal control locks and tow bar. Standard seating is a roomy five-place version with optional seating for up to seven occupants. Within its allowable gross weight, the Model 560 is one of the few multi-engine business planes capable of carrying a full load of passengers (up to 7 persons) and still providing a cruising range of more than 1,000 miles.

The new version incorporates a new heating and ventilating system, with a 25,000-BTU Janitrol combustion heater installed in the nose and with thermostatic regulation of cabin air temperature. Fourteen fresh air inlets are provided for ventilation with individually-controlled airline-type inlets at six passenger stations. Ground cooling is provided by a blower system which is a part of the heater unit. The entire system may be used to provide maximum fresh air flow for summer flying comfort.

Passenger comfort is enhanced by the provision of reclining chairs adjustable to three positions. All individual seats are mounted on tracks. An optional seating arrangement is offered with 6 individual chairs, giving all occupants "by the window" seating and allowing freedom of movement in the cabin during flight. All seats are removable in a matter of minutes and the unobstructed floor's Wedjit seat fittings can be used for hold-down straps for a large volume of cargo. On short hops, the Commander can air-lift 2,000 lbs. of cargo. Knee-high loading for both main cabin and baggage compartment facilitates cargo handling. The large 34-cu. ft. baggage compartment, which is accessible in flight, can carry as many as ten large bags and is completely lined to prevent scuffing of baggage.

Up front, the airline-type control column has been rigged 6 degrees forward of its previous location for more pilot comfort. An overhead switch panel is hinged in the Model 560 and through the use of Cam-Loc fasteners is readily opened for access to switches and circuit breakers.

A new auxiliary hydraulic system is provided as standard equipment. It provides a reserve of hydraulic fluid for emergency operation of brakes and flaps. A cast hydraulic tank makes for easier maintenance and servicing and a filter cleans the oil prior to usage.

A power steering unit for the nose wheel, operated by the rudder pedals, was introduced last year and has been improved by increasing nose wheel

travel to 28 degrees for shortened turning radius. A heavier steering cylinder piston is also newly added.

New interior styling offers four standard interiors and four optional custom interiors and the factory has made provisions for a wide variety of custom installations.

The center of gravity range has been extended about 1.5 inches rearward and is one of the widest ranges of CG travel (from 23 per cent forward to 34 per cent aft) in this type of aircraft. This allows considerable freedom in loading and stability has been proven in all three axis throughout this range of travel.

The factory has 15 domestic and 6 foreign distributors. Carl Wooten, sales manager, introduced the new Model 560 last month at a distributor meeting. ★ ★ ★

LOW-COST OMNI

(Continued from page 74)

constructed housing and in an easily transportable set of parts which can be quickly erected. The station package is so complete that it contains such elements as house wiring, obstruction light components and even a work bench. The system is designed for unattended service and remote control, although provision is made for an overriding local control.

The Collins system has as its principal components a VHF transmitter, a modulator, a modulation eliminator, a local control unit which also includes the automatic voice reproduction device, a station monitor with its antenna, transmitting antenna assembly with single, RF phase adjuster, and various accessories such as wiring and cable kits, lights and the like. The antenna and monitor are of an advanced type of design not used heretofore. They take advantage of many design and operational lessons learned in other Collins developments which have been in worldwide use.

The monitor continuously samples the amplitude and phase of the radiated signal. If a mal-function should occur, the monitor automatically removes the navigation information from the transmitter and operates an error indicator in the remote control unit to signal the immediate need for service. Alarm action occurs and navigation information is removed when the course shifts in excess of 1 degree or when the reference or variable modulation falls below 26.5 per cent or exceeds 34.5 per cent, or when the gain of the reference phase amplifiers of the monitor decrease to 85 per cent of normal.

★ ★ ★

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MODEL 220
SHAFT TURBINE
Jet power
FOR THE AIR AGE
Continental, a great name in power, offers advanced development and modern manufacture to serve those requiring turbine power plants for helicopters, fixed wing aircraft, or other applications. If you manufacture equipment with a present or a prospective use for turbines—shaft power, air generators or jets—discuss your engine problems with C.A.E.
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1500 ALGONQUIN AVE., DETROIT 15, MICHIGAN
SUBSIDIARY OF CONTINENTAL MOTORS CORPORATION

First deliveries of twin-engine Apaches began last month at Piper Aircraft's factory. Six of the 4-place, all-metal Apaches are shown awaiting delivery from the plant at Lock Haven, Pa. First delivery went to E. H. Brockenbrough, Carolina Aircraft Sales, Piper distributor at Charlotte, N. C. —(Piper Photo.)

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In the Canadian west and the U. S. southwest, Beavers as a tool of the oil industry are working daily...
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Apaches Go To Distributors

PIPER Aircraft Corporation has demonstrated its new 4-place, twin-engine Apache in all sections of the nation and last month began making deliveries to distributors, who are in turn widening the areas of demonstration.

The Apache's first nation-wide tour covered 50,000 miles and the demonstrator, N-1000P, was flown over 300 hours in two months. Close to 1,000 persons were given demonstration rides in the airplane during the tour. Flown by Sales Manager J. W. Miller and Assistant Sales Manager W. C. Smith, the tour was conducted primarily to show the new twin to Piper dealers. They attended separate district meetings conducted at Lock Haven, Pa.; Sarasota, Fla.; Ft. Worth, Tex.; Dayton, Ohio; Minneapolis, Minn.; Phoenix, Ariz.; Sacramento, Calif., and Vancouver, Washington.

Reporting on the tour, Miller said the trip was culminated by a flight from Vancouver back to Lock Haven in 13 hrs. 40 mins., with only two stops for fuel. These stops were at Billings and Minneapolis. Some sections of the trip were flown at 15,000 ft. W. T. Piper, president, and Service Engineer Bob Gift were with Miller and Smith on the long trip home.

Miller said that in almost every case, prospects on demonstration flights were put in the left seat. This was done whether or not they had previous twin-engine experience. Miller said the ability to put newcomers

Second Apache delivery made by Piper Aircraft was made last month to Lloyd M. Brown, Piper distributor at San Antonio, Tex. He is shown receiving his plane from W. T. Piper, president.
—(Piper Photo.)

to multi-engine flying on the left side "stems from the honest flight characteristics of the airplane, which was purposely designed to be flown by average pilots with normal flight proficiency."

Single-engine operations created much interest. Almost 30 hours were flown on just one engine during the tour. The Apache is equipped with full-feathering, constant-speed Hartzell all-metal propellers, driven by 150-hp. Lycoming 4-cylinder engines. Miller said the Apache has excellent single-engine characteristics.

Completion of the nation-wide tour coincided with accelerated service testing of a number of Apaches at the factory. Since the first Apache flew, more than 1,500 hrs. have now been logged in the air by the new design. Miller said the gruelling 300-hour demonstration tour served as an excellent proving period for the airplane under all conditions.

"Throughout the entire trip," he said, "only routine servicing was required."

At the factory, the Apache is now being produced in substantial volume, Miller reported. Apache No. 26 entered the final assembly line last month. A high degree of tooling has already been completed to reduce man hours in assembly.

The Apache carries a list price of $32,500 with complete equipment except radio.

Factory specifications and performance at gross weight include the following:

Gross Weight, lbs.	3,500
Empty Weight, lbs.	2,156
Useful Load, lbs.	1,344

MESSAGE TO AN ENGINEER THINKING ABOUT THE FUTURE— HIS FUTURE

Take a few moments now to review the progress of your career. Does your present position offer you a future that fully utilizes your creative abilities?

Compare your present assignment with the diversified, stimulating pursuits that increase the inventive challenge of Fairchild's team of qualified engineers. These men are working on engineering advances for the famous C-119 Flying Boxcar and the soon-to-be-produced C-123 Assault Transport. More than that, they are developing tomorrow's jet fighters . . . special reconnaisance aircraft . . . jet bombers and transports. The men at Fairchild know that *planned* project diversification keeps them in the forefront of the field of aerodynamics.

Gracious country living only minutes away from urban Baltimore or Washington . . . paid pension plan . . . an excellent salary with paid vacations . . . ideal working environment . . . generous health, hospitalization and life insurance . . . and the many other benefits of a progressive company add to the pleasure of working with Fairchild.

You'll be investing wisely in a secure future if you take time today to write to Walter Tydon, Chief Engineer, outlining your qualifications. Your correspondence will be kept in strict confidence, of course.

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GLENVIEW METAL PRODUCTS COMPANY at Delanco, N. J., is advertising that it is going to produce a low-cost 2-place "FlyRide" helicopter (pictured above) with simplified controls consisting of "a stick with motorcycle grip for forward, reverse and turn movements" and "gas throttle worked by foot to control ascent and descent."

Span, ft.	37
Length, ft.	27.1
Height, ft.	9.5
Wing Area, sq. ft.	204
Wing Loading, lbs./sq. ft.	17.2
Power Loading, lbs./hp.	11.7
Baggage Cap., lbs.	200
Fuel Cap., gals.	72
Top Speed, mph.	180
Cr. Speed (6,000 ft.), mph.	167
Stall Speed, mph.	59
Take-off Run, ft.	900
Landing Roll, ft.	670
Rate of Climb, fpm.	1,350
SE Rate of Climb, fpm.	205
Abs. Ceiling, ft.	22,000
SE Ceiling, ft.	5,250
Cr. Range, miles	850

★ ★ ★

Get IMMEDIATE DELIVERY of your EXECUTIVE AIRCRAFT from

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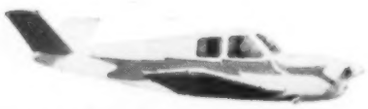

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HYDROMATIC, de-icers, nose tank, A. R. C. 15 VHF Omni, T-11 VHF Transmitter, R-15 VHF Receiver, F-11 Iso. Ampl., speakers. Lear LVTR-36 VHF, Collins 17E2 MJF. ADF, marker, glide path, LF receiver, radio panel. Five seats, covers, lavatory, deluxe.

$49,500

TWIN BONANZA
June Delivery

Fresh Out
of Doves and Mallards,
but we are expecting more to be traded in soon on our
SUPER-92 DC-3

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Several have been offered in trade on our SUPER-92 DC-3. Fully converted. Write for specs.

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*Two other Beech D-18s received in trade. Write for specs.

Super-92 DC-3 Low Total Time

New ship guarantee, complete 8000 hour overhaul, SUPER-92 engines, Collins radio, beautiful custom interior, 200 mph. All have the new Remmert-Werner exclusive large cabin and picture windows for eye level vision.

BELL ROTOR-WING

(Continued from page 59)

Bart Kelley, Bell Aircraft's chief helicopter engineer and an internationally-known authority, says the rotor-wing design by Bell has no limit in size. "We will be able to build a machine according to the demands of commercial airlines or other potential users," Kelley said.

"Center of gravity will not be critical in this new design," he added. "The side-by-side rotor configuration will permit differential lift control to compensate for uneven loading throughout the span of the wing. This is similar to longitudinal loading characteristics of present tandem-rotor craft and is the first adaptation of such a system to a side-by-side machine. Thus, even approximate distribution of passenger and cargo weight will present no problem."

Bell is one of the world's largest helicopter manufacturers and can be expected to present the new concept to the armed forces for development. In addition to present design work on the new configuration, Bell is also studying an adaptation in which tilting rotors would be used, as on the military convertiplane which it is producing.

★ ★ ★

JUST AMONG OURSELVES

(Continued from page 13)

tion's air space belongs to all the people since their hard-earned dollars are financing the airways system as well as everything else going on today. From the difficulty the airlines are having while operating out of fields taken over by the military we can readily see the smoke trails in the sky, pointing out the real objective the military boys have in mind. The military theories on air traffic will soon keep the people away from the major terminals where they conduct the nation's business and make the money to pay the exhorbitant tax bill created by a never-satiated, inefficient and power-drunk military machine.

This is not the first time the military has attempted to militarize the airways. If they could have their way a small clique in the Air Force would militarize the entire aviation industry. The present signs are reminiscent of a similar attempt to take over in 1941 when the then CAA administrator, Charlie Stanton, with help from friends in the industry, valiantly fought it out and won. Again in 1947 disagreement between CAA and the Air Force cropped up over ILS and GCA. Our friends in Congress, notably Carl Hinshaw, saw to it that funds were withheld until agreement could be reached on what we now know as the "common system," meaning common to all.

The military services agreed to support this system — until the Korean mess, when they tried to take over again. Now the established and workable VOR-DME system is being threatened by the military's championing of the TACAN system, which they can't show us but desire to cram down our throats. The TACAN deal is a piece of the same old story. They tell us it's the old familiar "eight-pound box" that simply does everything! They don't mention the millions of dollars it would require to throw out the present workable system. And let's not forget the hundreds of millions of dollars that went into little black boxes on military aircraft of World War II and wound up in the junk yards from Walnut Ridge to Wenatchee. It was "military design" radio equipment, originally to weigh only "eight pounds" and "do everything" including the family wash. Since those days our radio and electronics industry and the CAA development people can claim most of the credit for electronic progress.

Military domination of the Air Navigation Development Board is a

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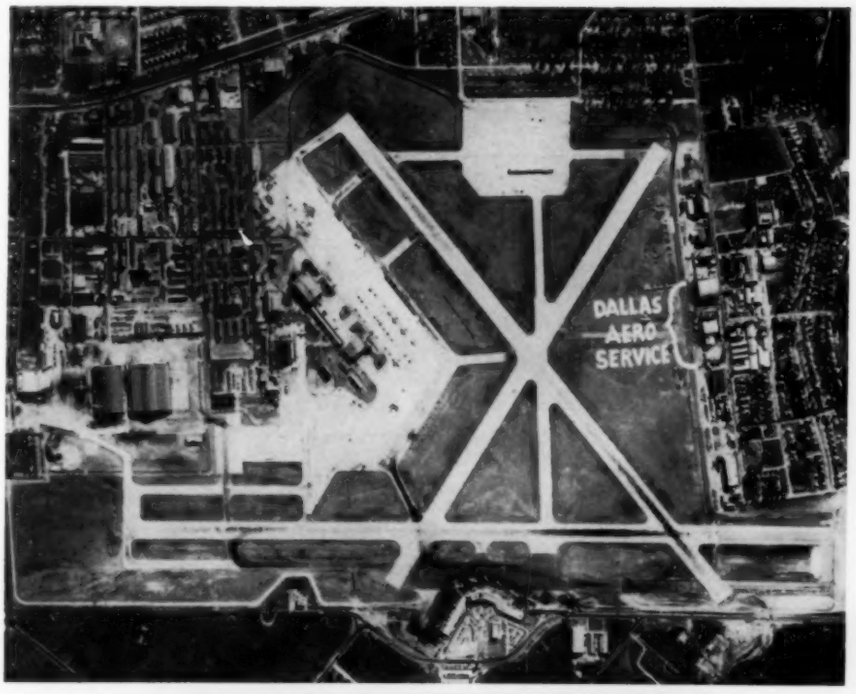

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- **Owners of such aircraft are sure of finding genuine Continental parts and competent mechanics wherever they may fly. They benefit in other ways, too, from Continental's policy of backing those who build and those who use Continental-powered products.**

- **Corporate owners, in particular, appreciate the plan which makes factory-remanufactured engines available on an exchange basis. This Continental-pioneered service, now several years old, practically eliminates dead time when overhaul is required, and provides a guaranteed power plant, with zero hours, at a fixed low cost. Its availability through 125 master distributors with dealers at practically all airports makes it, truly, another good reason for flying with Continental power.**

SERVICE EVERYWHERE

Continental Motors Corporation
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good possibility, if not already an accomplished fact. After all, allocation of most of the dollars being spent today is by the military services. He who controls the purse strings controls the policies. If you don't believe it look at the Air Coordinating Committee report, just released by the White House! The military can take over the "common" system just about anytime it wants to.

All these recent happenings lead us to believe that a new attempt to militarize the airways is well on the way, another attempt to cut off our commercial utilities at the house. What we need right now is another Charlie Stanton in the CAA. But no matter where you look there just doesn't seem to be one who can stand up to the old railroader, "Mainline" Murray, the Under Secretary of Commerce, and the clever military policy makers who are gradually sealing the doom of freedom of the air. ★ ★ ★

CESSNA BOOTS

(Continued from page 62)

deliveries of the Twin. In the spring of 1955, Cessna will bring out a second set of gyros, these to be electrically driven, for the airplane.

The de-icing system now available provides leading-edge boots for the wing and horizontal stabilizer. These boots were designed especially for the Cessna 310 and are made by the B. F. Goodrich Company.

It is a pneumatic system using compressed air. The power source is a combination pressure and vacuum pump, one of which is installed on each engine in the 310's small nacelles. The boots contain tubes which are alternately inflated and deflated to break up ice formation, with the slipstream carrying the ice away after it is broken up.

Also developed for the Cessna 310 is a propeller fluid anti-icing system. This is fed at the propeller hub by a slinger ring and transfer tube using Goodrich propeller boots. Alcohol for the propellers is stored in tanks carried in each wing, the installation having a 5-quart capacity. This is good for 45 minutes of normal operation. An electrical pump, controlled by a rheostat on the instrument panel, supplies alcohol in desired quantities to the propellers to prevent the formation of ice on the blades.

Cessna is pricing its de-icing system (wing and stabilizer boot system) at $4,750 installed. Its propeller anti-icing system is priced at $635 installed. These figures cover a turn-key job and include all parts and equipment.

Cessna says the smooth fitting of the

boots, which are a new type adapted from installations on jet fighters, is such that there is no appreciable change in the performance of the Model 310 when flown with the boots installed.

The installation adds 91.7 lbs. to the airplane empty weight. Weights of the new equipment are as follows:

De-icer equipment (wings and stabilizer system, including pumps, plumbing and installation ..... 75.4 lbs.

Anti-icing equipment (propeller system, including boots, plumbing and alcohol storage) ..... 7.3 lbs.

Fluid for propeller system (5 qts. of alcohol) ..... 9.0 lbs.

Total installed weight ..... 91.7 lbs.

Demonstration Performance

Lee Renshaw and Fred Roscoe of the factory sales department have demonstrated the new 310 to hundreds of people around the country. The demonstration usually consists of a hop to 10,000 ft. and lasts 45 minutes to an hour.

A typical demonstration hop was with the pilot and three passengers and about 20 gals. of fuel. Take-off was at about 70 mph., the wheels leaving the runway only about 600 ft. from the start of the run into a wind of about 18 mph. Acceleration was rapid to about 95 mph., which is the airplane's single-engine safety speed, after which the nose was trimmed for climb at 140 mph. indicated air speed. At this speed, the 310 was climbed out at more than 1,000 fpm. It will climb out at better than 1,700 fpm. with slower speed, but at 140 mph. the airplane is in a very fast cruising climb which covers quite a bit of distance over the ground while rising to cruising altitude at a rapid rate.

It was leveled off at 8,000 ft. for a speed check. With 22 inches of manifold pressure and 2,300 rpm., the indicated air speed was 177 mph. This trued out at 208 mph. A short climb to 10,000 ft., was made to try a speed

SPERRY SPARROW AIR-TO-AIR GUIDED MISSILES, for use by carrier-based jet aircraft in destroying enemy aircraft, are pictured above. Rocket-powered and fully maneuverable at supersonic speeds, the Sperry weapon is light enough to be carried by jet fighters. They are shown on a Douglas F3D Skynight twin-jet fighter.
—(Navy Photo.)

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A—*Tune the Lear ADF to the desired station—instantly the hand will point the way to go.*

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C—*As hand swings to 180° you are over the station.*

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D) To check the thermocouple harness ring on the engine before its installation in the airframe.

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FIRST SWEPT-WING JET IN SQUADRON SERVICE WITH THE NAVY, this is the new Grumman F9F-6 Cougar. It is shown carrying two 1,000-lb. bombs. The Grumman carries a variety of external stores for use in combat air patrol, armed reconnaissance, flak suppression and missions with rockets, bombs or strafing. It mounts four 20-mm cannons in the nose.

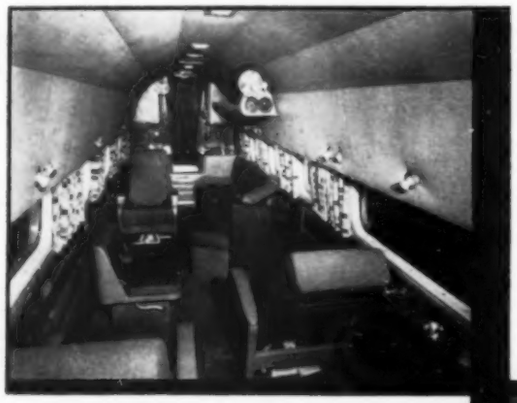
(Grumman Photo.)

check at that level, where the indication was 168 to 170 mph. at a power setting of 20 inches and 2,300 rpm. This trued out at 205 mph.

At the light loading used, the 310 was demonstrated in single-engine flight at 10,000 ft. It stabilized at an indicated air speed of about 115 mph., using 24 inches of manifold pressure and 2,300 rpm. The demonstration included feathering and unfeathering without the use of rudder pedals.

Renshaw said his fuel consumption at cruising speeds of about 205 mph. was running around 22 gals. per hour for the 240-hp. Continental engines which power the Cessna 310. Wingtip fuel tanks contribute materially to the airplane's excellent stability and climb, he said.

Most persons receiving demonstrations commented on the completeness of the airplane and its equipment, as well as on the top-notch workmanship and finish. Simplicity of the fuel system has also been attracting favorable



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MORE BEECHCRAFT SALES FOR 1954 is the topic for a new series of sales conferences at the factory being conducted by Beech Aircraft Corporation for its distributors, dealers, sales managers and salesmen. First group to attend the factory conference is shown above. Pictured are, left to right, Joe Farrell, Ohio Aviation, Vandalia, O.; Ray Fisher, C. J. Abbott & Company, Omaha, Nebr.; Frank Kelsey, Kemp & Kelsey Airservice, Inc., Salt Lake City; Silas King, Flightcraft, Inc., Portland, Ore.; Dick Gelley, Atlantic Aviation Service, Inc., Wilmington, Del.; Art Hoffman, Gopher Aviation, Inc., Rochester, Minn.; Gerry Francis, Francis Aviation, Lansing, Mich.; Gene Larimer, Atlantic Aviation Corp., Teterboro, N. J.; Gail Clark, Tulsair Distributors, Inc., Tulsa, Okla.; George Cokain, Roscoe Turner Aeronautical Corp., Indianapolis, Ind.; Phil Van Meter, Butler Airplane Sales, Chicago; Jack Graham, Aircraftco, Inc., Wichita; Wally Balzerick, Beechcraft sales promotion in charge of the conference; Orin (Moose) Redhead, Aircraftco, Inc., Wichita; Carl Gargano, Memphis Aero Corp., Memphis; Ed Box, Cutter-Carr Flying Service, Inc., Albuquerque; and Dan Stanley, Ohio Aviation, Vandalia, O.
—(Beech Photo.)

comment. On the cabin floor between the two front seats are two fuel selector valves. One is for the left engine and the other for the right engine. Each has three positions — "left tank," "right tank" and "both off." These allow for operation of each engine from either tank. The tanks carry 50 gals. of fuel each.

★ ★ ★

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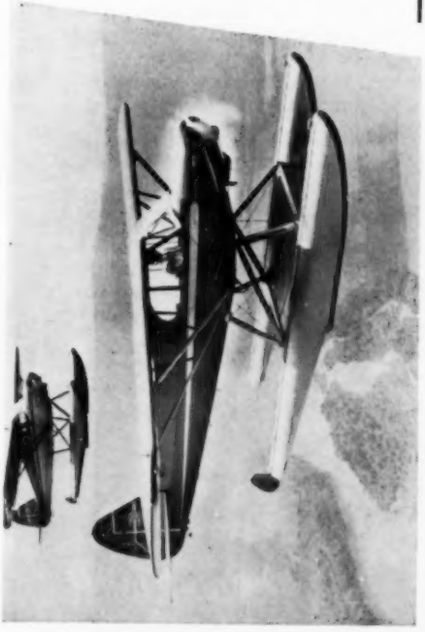

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Questions and Answers for Airport Operators

It's a Common Trouble

THIS is an answer to a question from an airport manager. It was addressed to us and it concerns airports. Being all about troubles on an airport, the root of the problem lies in people. The question might as well have been addressed to the old family doctor, a minister, the parish priest or the kind of jurist who has spent a quarter century in a court where people come to settle their small disputes in a large way.

The problem centers around an airport manager and a fixed-base operator. Ten years ago the FBO asked the manager, who was fairly new at his job then, for a small favor. The manager made him wait a few days while he considered the request and finally turned it down on the basis it would give the FBO an unwarranted advantage over two other operators at the field. Those years have passed. The FBO has been successful and has made money and is still doing so. The manager has done a good job and still holds that job although the payroll lists his as "director of aviation" now.

Both those persons are working toward the same end. Both are trying to develop in their town and on that airport the most acceptable types of aviation services for the community. But they are doing what they do alone, each in an independent manner.

The manager bends over backward to act toward the operator in what he believes is an unbiased attitude. But — and this is an important factor in the feeling that now exists — he has so much pride that he would never let the operator know that.

The operator makes a point of regarding the manager as unfriendly and when he wants something he ignores the manager, going to the city hall instead. When he gets it, it's a triumph over the manager. When he doesn't get it, it is because the manager interfered. Actually at the city hall, they just send the requests along to the manager and he makes the decisions.

These people are both mighty good men. We have known them for years.

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SAYS: *Carl G. Triest*
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Mr. Triest, airline transport pilot #29648, soloed in 1930. He commutes between Tulsa and New York in a Bonanza. He has flown over 1400 hours, more than 225,000 miles on Continental engines, in the past three years.

P.S. The $88.00 went for a rotating beacon from Central Aero Supply, Woodbury, New Jersey.

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but every time we go to that town, we see they are getting farther and farther apart, despite the fact that together they could do so much more to make that airport an outstanding one. And business wouldn't be hurt by that. We get an almost uncontrollable urge to knock a couple of hard noggins together every time we talk to either one of them.

Here's one thing that has developed from the situation that affects every operator on the field. The manager reportedly hasn't been in this operator's hangar for years because of the feeling. That's hard to believe but we're told it's true. As a result he is circumspect regarding the frequency of his visits to the hangars of the other operators, for he is sure in his mind that he will be accused of favoritism if he spends very much time with the first FBO's competitors.

Now the time has come when the FBO is fighting for a change in basic policies established long ago, actually before the manager took his job. He's doing his arguing with the mayor and the city council. His progress is mighty slow. He blames the manager for it, but he doesn't ask the manager what he thinks about it. In fact he is convinced that he hasn't gotten any place because the manager is fighting him behind closed doors.

He's talked to us about the changes he has proposed and we believe he is right. The manager has talked to us also and the surprising thing is that he believes in the same things the operator believes in and has told the folk at the city hall so. Down there it is believed that the operator has finally got the manager scared and he is agreeing only because of that.

All the deal needs is for those two to get together and appear before the next council airport committee meeting with both on the same side and actually fighting for what both want. Each would like to end this purposeless feud but each is afraid to start a peace-making gesture for fear he'll be rebuffed.

That whole story sounds silly, doesn't it? Look around you. In an

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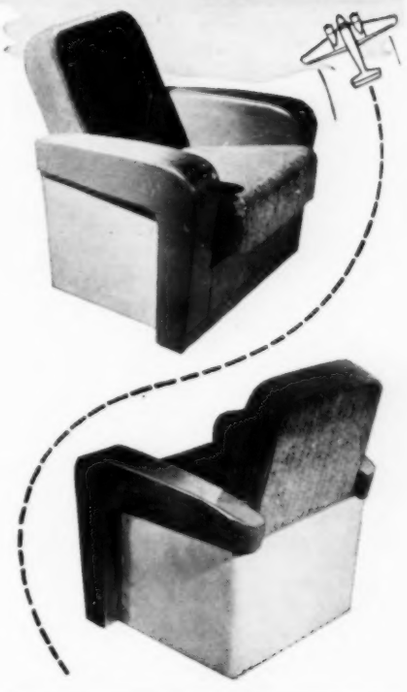

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★ Twin Beech	★ Grumman Widgeon
★ Consolidated B-24	★ Grumman Mallard
★ Cessna 310	★ Learstar
★ Convair 340	★ Lockheed Lodestar
★ Boeing B-17	★ Lockheed PV-1
★ DeHaviland Dove	★ North American B-25
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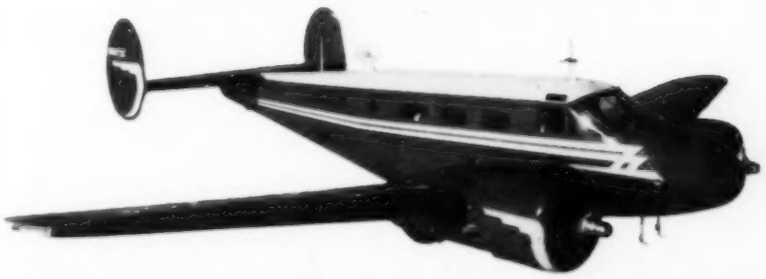

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ABILENE AVIATION COMPANY

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industry that still has so far to go, look at the feuds between different segments of the industry, or indifference in one to what happens to the other; strife between airports and the users; lack of confidence between groups; conflict even between near and neighboring cities. Aviation is like the guy who got on his horse and rode off in all directions.

We know the answer to the troubles between that airport manager and his operator, but we don't know how to convince either or both of the good sense that lies in stuffing pride in the pocket and getting together for the good of everybody and that's especially true when there exists so many greater cleavages that should be mended.

A British Visitor

We spent a few hours the other day with Leonard Mills, assistant secretary of airports, Ministry of Transport and Civil Aviation, London, who is spending some time in this country studying airports. It appears that airports over there are frequently troubled with birds on the runways. Apparently these are gulls. We've seen gulls even on inland airports here. ★

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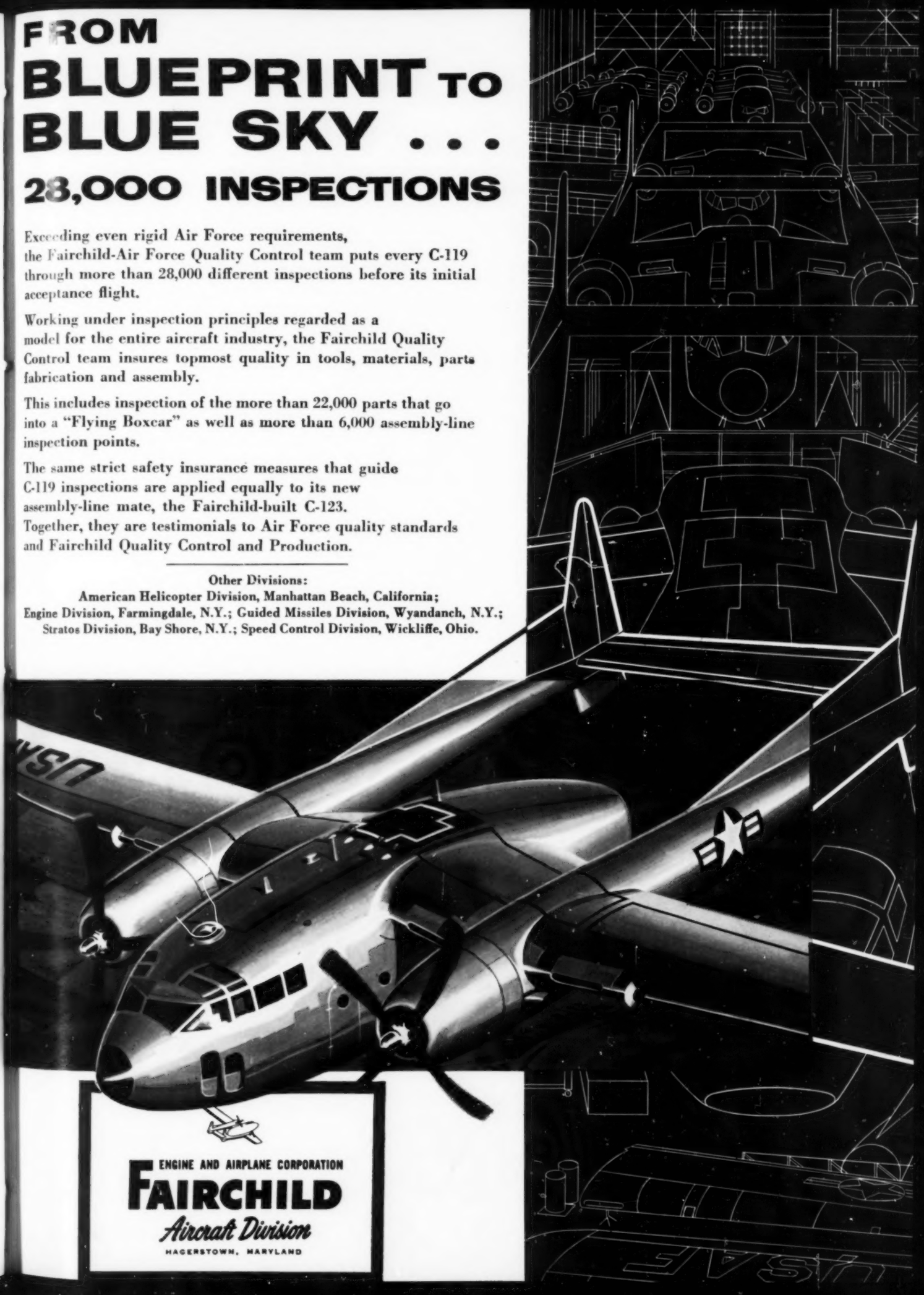

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